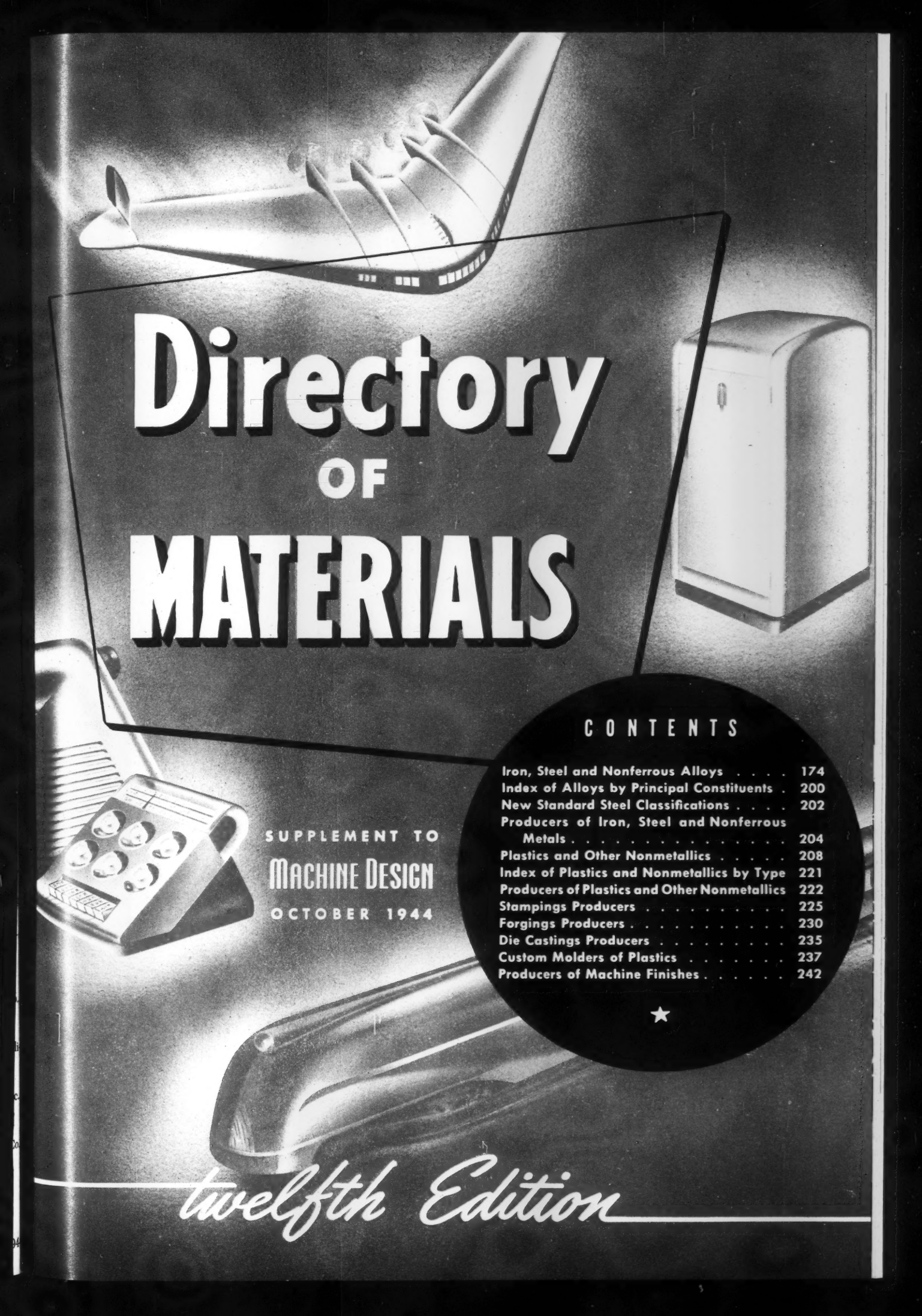

Directory OF MATERIALS

SUPPLEMENT TO
MACHINE DESIGN
OCTOBER 1944

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★

twelfth Edition

sabeco bronze increases life and efficiency of vital moving parts 2 to 10 times

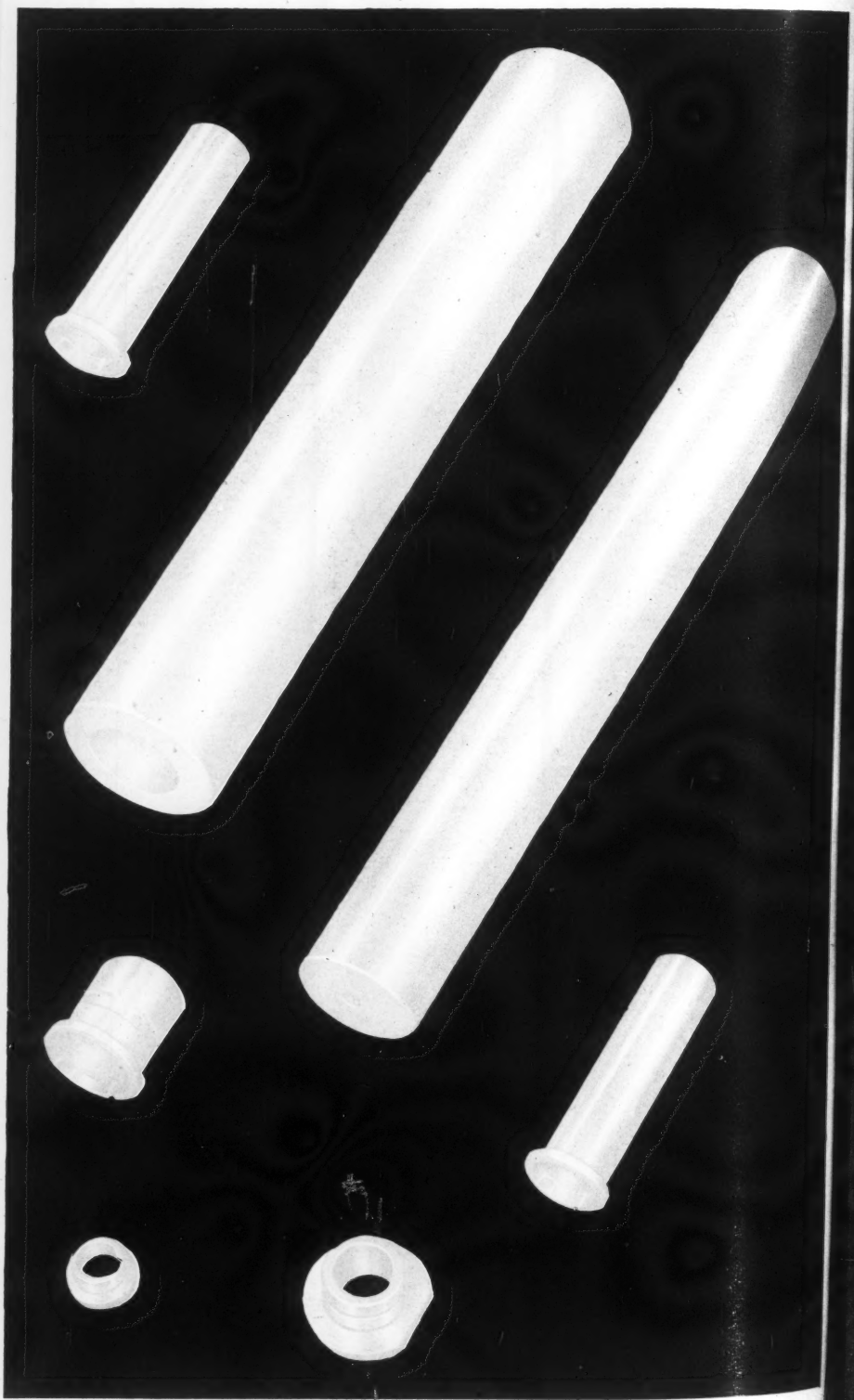
• operates with water as the only lubricant

Sabeco Bearing Bronze, the result of 30 years exhausting research, gives two to ten times or more wear than other bronzes. Sabeco does not score or seize the shaft even when lubrication is totally stopped. Sabeco will even operate satisfactorily with water as the only lubricant.

SABECO will help cut your power costs because it develops less starting friction and considerably less running friction than ordinary bronze due to its high lead content. SABECO is easily machined since it contains no hard spots and readily takes on a high finish. This in turn, will help you save money in your machining.

SABECO bronze is ideally suited for parts of aeroplane, automobile, Diesel and gasoline engines, outboard motors, turret lathes, washing machines and for bearings, including locomotive side rod and Diesel electric locomotive bearings, locomotive valve gear bushings, oil seals, fuel pump seals, refrigeration and air conditioning compressor seals, all machine applications such as lead screw nuts, clutch shifter shoes, etc. and maintenance repairs.

SABECO is available in five grades and three forms: Rough castings, stock bars (solid or cored) or completely finished and machined to your blueprints. Sabeco No. 5 corresponds to A.M.S. 48 40. Send your problems, including sketches, to our engineers in Saginaw. Write for free booklet, "Men and Metals."



SAGINAW BEARING CO.

894 SOUTH WATER ST., SAGINAW, MICH.

CABLE ADDRESS "SABECO"

HILLS-McCANNA
MAGNESIUM ALLOY
SAND CASTINGS

HILLS-McCANNA Magnesium Alloy Sand Castings are doing wonders for our War Planes . . . and will do wonders for your peace-time products, too!

Lightest in weight of all structural metals . . . tough and strong, Magnesium Alloy Sand Castings offer Industry unsurpassed advantages for reciprocating parts of machinery, portable and manually handled tools, transportation equipment, office machines, aircraft engine parts, landing wheel assemblies, household appliances, etc.

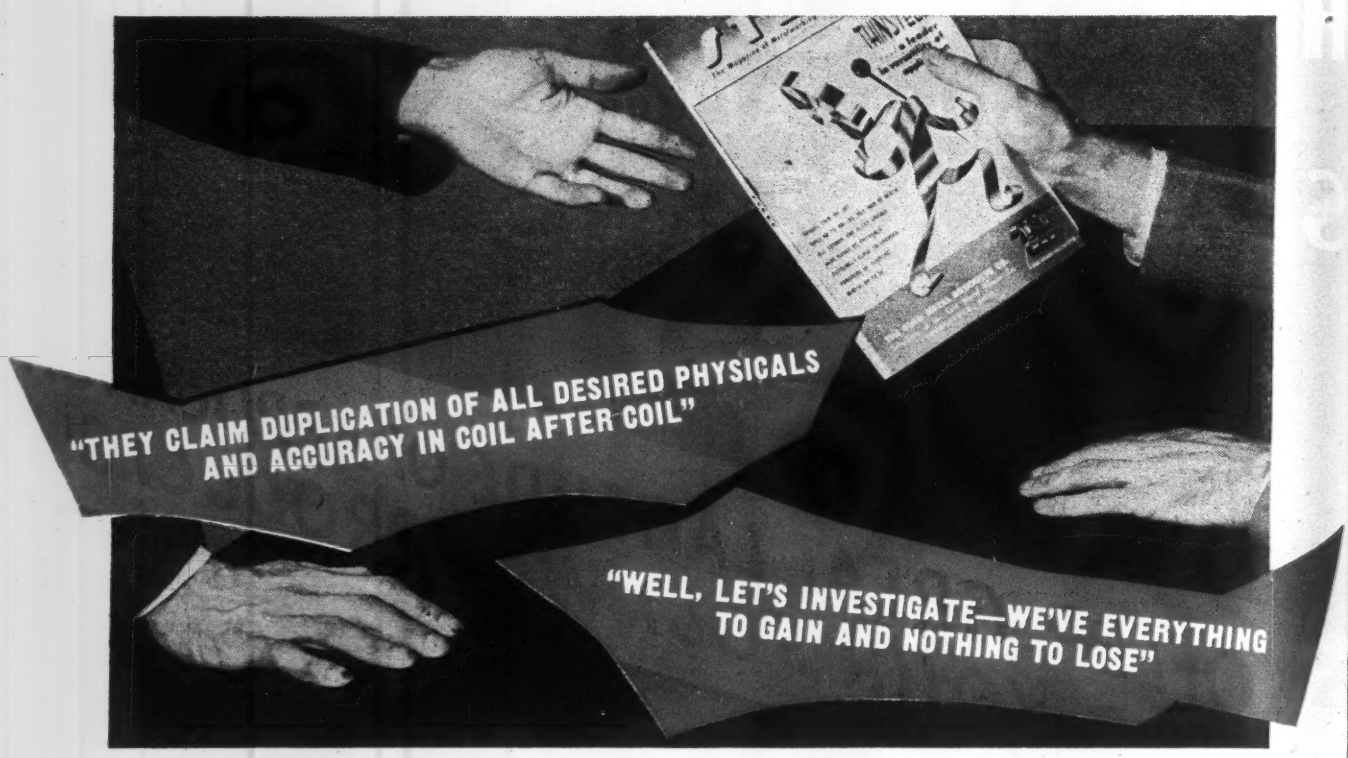
Our large modern foundry, fully equipped and in mass production, assures quality castings, backed by dependable chemical and metallurgical control, heat treatment and complete machining facilities at reasonable cost.

Let us work with you in adapting Hills-McCanna Magnesium Sand Castings to your particular needs.

HILLS-McCANNA CO.
3019 N. WESTERN AVE., CHICAGO 18, ILL.

Manufacturers of
PROPORTIONING PUMPS • AIR & WATER VALVES • CHEMICAL VALVES
MARINE VALVES • FORCE-FEED LUBRICATORS • MAGNESIUM CASTINGS

FOUNDERS OF NON-FERROUS ALLOYS SINCE 1870



That's the way . . .

PUT THINSTEEL TO TEST!

THINSTEEL FACTS

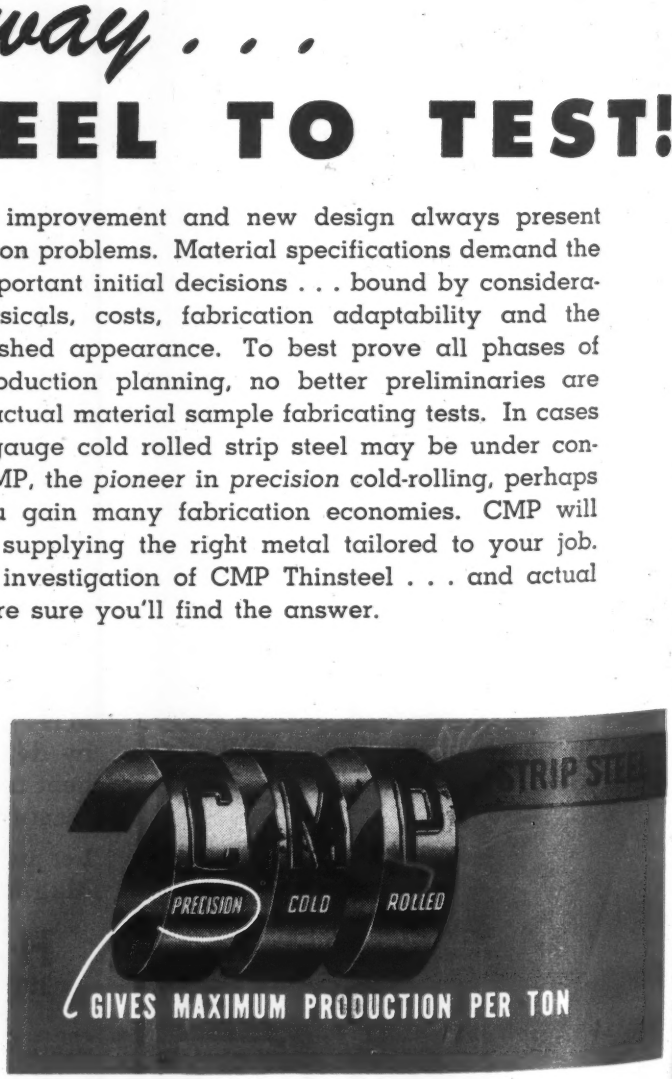
GAUGES THIN AS .001"
WIDTHS UP TO 24"
COILS UP TO 300 LBS. PER INCH OF WIDTH.
EXTREMELY CLOSE TOLERANCES.
STANDARD AND SPECIAL TEMPERS.
STANDARD FINISHES.
CARBON AND ALLOY GRADES.
WIDE RANGE OF PHYSICALS.

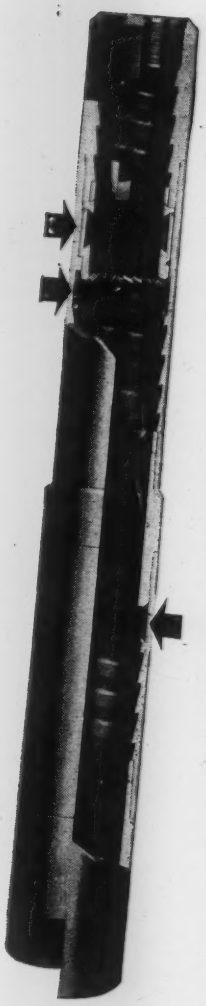
Product improvement and new design always present fabrication problems. Material specifications demand the most important initial decisions . . . bound by considerations of physicals, costs, fabrication adaptability and the product's finished appearance. To best prove all phases of profitable production planning, no better preliminaries are known than actual material sample fabricating tests. In cases where light gauge cold rolled strip steel may be under consideration, CMP, the *pioneer* in *precision* cold-rolling, perhaps can help you gain many fabrication economies. CMP will cooperate in supplying the right metal tailored to your job. And in your investigation of CMP Thinsteel . . . and actual tests . . . we're sure you'll find the answer.

THE COLD METAL PRODUCTS CO.

SUBSIDIARY OF THE
COLD METAL PROCESS CO.

YOUNGSTOWN, OHIO





Parts supplied by The Murray Rubber Company

More *proof* that Hycar can handle the tough jobs

THE arrows in the right hand picture point to synthetic rubber pack-offs that play an important part in a tool used for recovering broken drill pipe from oil wells. In service, these resilient rings encounter oil and gas, a variety of different acids, and high temperatures. And they have to stay resilient to provide a positive seal. A tough assignment!

Hycar was selected for this job because it has the right combination of properties needed to meet these severe service conditions. For the same reason men throughout all industry are learning that Hycar is the right material for pump and valve packings, grommets, diaphragms, vibration dampeners, hose and scores of other industrial applications.

What qualities do you need in rubber parts? Check the list of properties shown in the box at the right. Keep *your* requirements in mind. Then ask for parts made of Hycar to test in your own applications or products. Learn for yourself that it's wise to use Hycar when the going gets tough. *Hycar Chemical Company, Akron 8, Ohio.*

Check These Superior Features of Hycar

1. EXTREME OIL RESISTANCE—insuring dimensional stability of parts.
2. HIGH TEMPERATURE RESISTANCE—up to 250° F. dry heat; up to 300° F. hot oil.
3. ABRASION RESISTANCE—50% greater than natural rubber.
4. MINIMUM COLD FLOW—even at elevated temperatures.
5. LOW TEMPERATURE FLEXIBILITY—down to —65° F.
6. LIGHT WEIGHT—15% to 25% lighter than many other synthetic rubbers.
7. AGE RESISTANCE—extremely resistant to checking or cracking from oxidation.
8. HARDNESS RANGE—compounds can be varied from extremely soft to bone hard.
9. NON-ADHERENT TO METAL—compounds will not adhere to metals even after prolonged contact under pressure. (Metal adhesions can be readily obtained when desired.)

Hycar

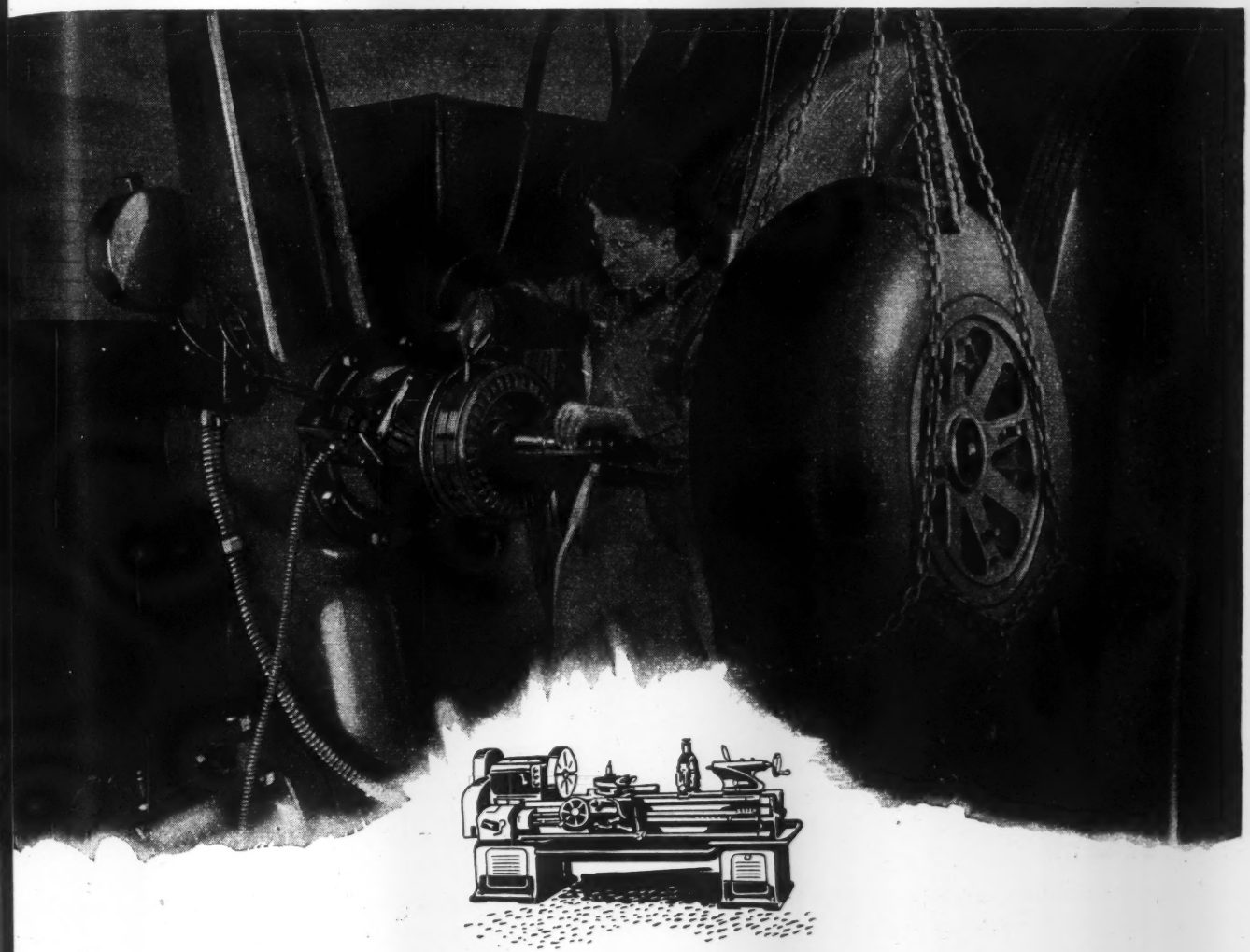
Reg. U. S. Pat. Off.

LARGEST PRIVATE PRODUCER OF BUTADIENE TYPE

Synthetic Rubber

Free—write for your copy of the new pocket-size Hycar Glossary of commonly used synthetic rubber terminology.

thin sections in
ALUMINUM
MADISON-KIPP DIE CASTINGS
by the millions
Die Castings made by the Madison-Kipp patented Hi-high pressure process were the first successful aluminum die cast Ordnance components made for World War II. They eliminated bottlenecks. They were delivered on time and by the tens of millions. Die Casting is the spectacular short cut from pig metal to finished parts whether for Ordnance or essential civilian requirements.
Sole Agents in England, Wm. Coulthard & Co., Ltd., Carlisle
MADISON-KIPP CORPORATION
213 Waubesa Street, Madison 4, Wis., U. S. A.

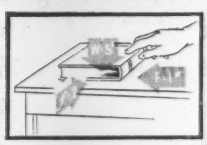


Back of every Velvetouch Installation . . .

Behind each Velvetouch clutch facing and brake lining are years of leadership in developing powdered metal friction materials . . . plus the facilities of a well equipped laboratory devoted exclusively to the study of pairs of *rubbing surfaces.* Modern science and engineering skill can produce no finer friction materials than Velvetouch for clutches and brakes. You can safely specify Velvetouch for rugged, heavy duty operating conditions in all types of industrial machinery.

THE S. K. WELLMAN COMPANY
1374 EAST 51st STREET • CLEVELAND 3, OHIO

Interesting facts about *Friction*



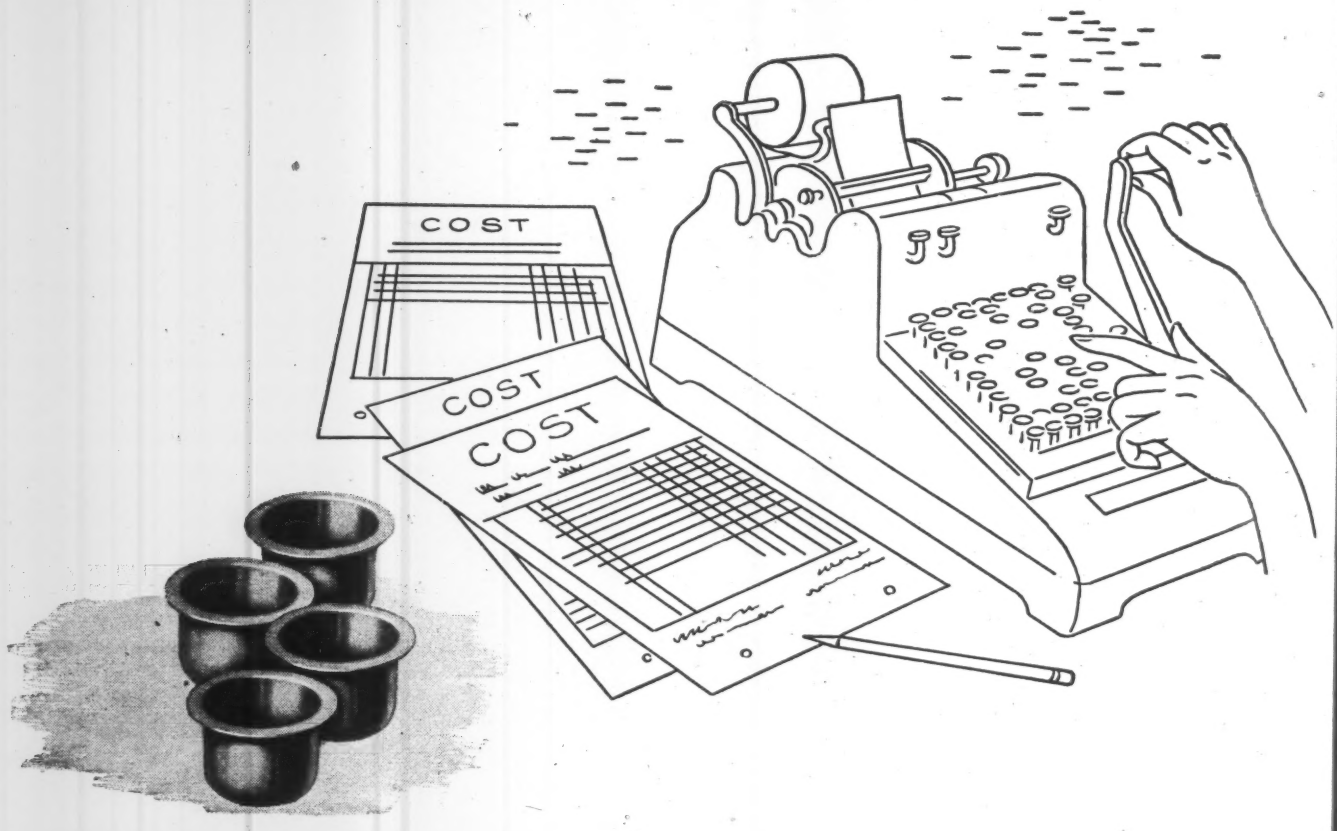
The coefficient of friction (f) of a book sliding across a table top is easily determined by dividing the force required to move the book (F) by the weight of the book (W).

Because many factors affect the coefficient of friction, i. e. speed, pressure, temperature, etc., it is impossible for any material to have a uniform coefficient of friction under all operating conditions.

The powdered metals in Velvetouch are combined in a wide variety of "mixes" to give the best possible coefficients of friction for each installation.

For Brake and Clutch . . . Use Velvetouch

Velvetouch is *all metal* — a combination of powdered metals, compressed, sintered and welded to a solid steel backing.



HOW DOES HACKNEY VOLUME DECREASE YOUR COSTS?

• Pressed Steel Tank Company's volume makes possible the production of better products—products which give you longer, lower-cost service.

Hackney shapes and shells are giving you the benefits of the chemical and metallurgical research utilized in the selection and testing of raw materials. They provide the advantages of uniform size, weight, strength and capacity maintained by modern heat-treating and quality control equipment. Light in weight, they assure the economies resulting from Pressed Steel Tank Company's more than 40 years of experience in the fabrication and deep drawing of various metals.

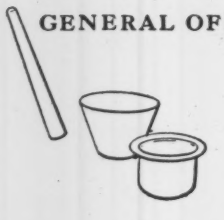
At Pressed Steel Tank Company, we are busily engaged in making war products. But as soon as war restrictions can be relaxed and there is more material available for civilian needs, Hackney's product development work and volume manufacturing will be at the disposal of *every* concern.

Pressed Steel Tank Company

Manufacturers of Hackney Products

GENERAL OFFICES AND FACTORY • 1435 SOUTH 66th STREET

Milwaukee 14, Wisconsin



DEEP-DRAWN SHAPES AND SHELLS

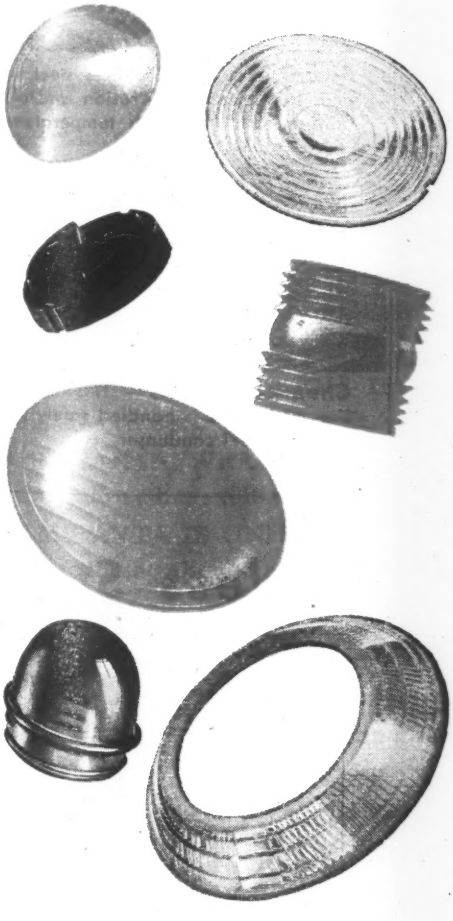
Engineers—

Manufacturers—

Equipment Designers—

find many interesting possibilities in **KOPP**

industrial glass



★

Illustrations above are typical industrial glass items designed and made to meet specific requirements of individual customers.

Whether you are planning your post-war products, seeking substitutes for critical materials, or looking for ways of improving present construction, the characteristics provided by the various types of Kopp industrial glass are worth serious investigation.

HIGH STRENGTH

Marked advances in the art of making high-strength glass have opened new fields for the use of this material in industrial product design.

ACCURATE COLOR TRANSMISSION

Extensive experience with signal and other colored glassware has given Kopp a unique ability to produce *precisely* and in large quantities, exact colors and shades desired.

THERMAL SHOCK RESISTANCE

Glass that will withstand repeated violent changes of temperature, developed by Kopp, further enlarge the scope of usefulness of this material.

SPECIAL DEVELOPMENTS

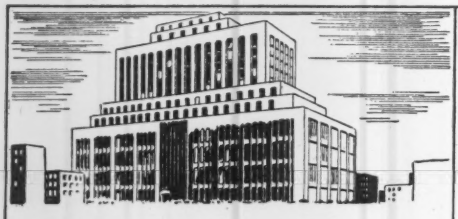
Glass having many other special qualities such as ultraviolet light transmission, precision-molded shapes, accurate control of light beams, impact-resisting properties, etc., has been developed and made by Kopp to meet the specific requirements of industrial manufacturers.

If you wish to investigate the possibilities glass offers you, we will be glad to tell you more about specific types suitable for your applications.

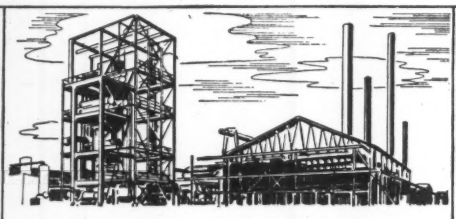
KOPP GLASS INC.

SWISSVALE, PENNSYLVANIA

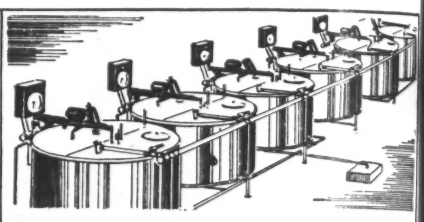
Stainless Steels Are Specified For These Applications:



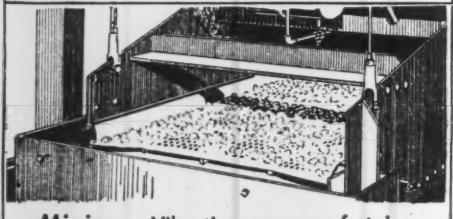
Architecture — For weatherproof exterior trim, stainless steel is not excelled in beauty or length of life.



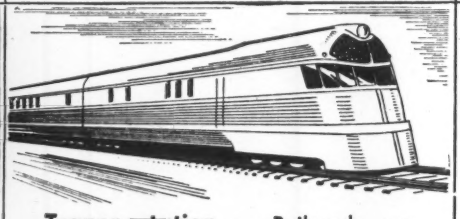
Refineries — Furnace tubes, carrying corrosive gases at high temperatures, are made of stainless steel.



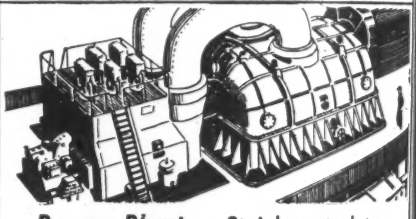
Food processors — Stainless steel milk processing equipment will not taint milk and is easily kept sanitary.



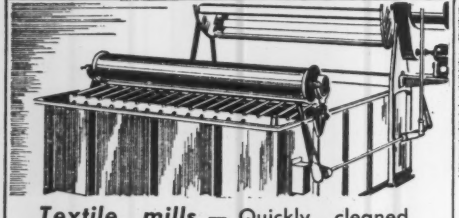
Mining — Vibrating screens of stainless steel resist abrasion and wear to give extra life.



Transportation — Railroads use light-weight passenger equipment built of stainless steel.

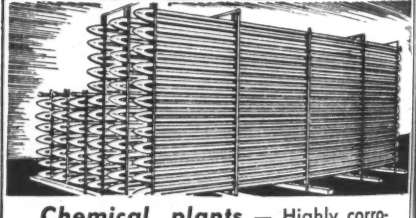


Power Plants — Stainless steel turbine blades resist corrosion and erosion of steam at high temperatures.



Textile mills — Quickly cleaned stainless steel dye vats make possible a rapid succession of dye baths.

Hospitals — Stainless steel surgical instruments resist corrosion from repeated high-temperature sterilization.



Chemical plants — Highly corrosive nitric acid is handled safely in a stainless steel condenser.

Have You Considered Using Stainless Steel?

• These are only some of the uses of stainless steel, but they may suggest how stainless steel can serve you. Although we do not make stainless steel or steel of any kind, we have had 38 years of experience in the manufacture of ferro-alloys used in the production of steel. Working closely with the steel companies and the users of stainless steel, our engineers have accumulated information on the use of stainless steel in many industries. If you want more specific details about a particular application, write to us.

BUY UNITED STATES WAR BONDS AND STAMPS

ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

Electromet
Trade Mark
Ferro-Alloys & Metals

The word "Electromet" is a registered trade-mark of Electro Metallurgical Company

bearings built to take

DEPTH BOMBING

Another example of versatile Micarta at work

Uncle Sam's subchasers can't help but take some part of the beating they dish out.

The same force that crushes the enemy subs pounds hard on the wetted surface area of the subchaser that dropped the depth charge, placing an added stress on stern tube bearings. For this severe duty, many of these craft are now using Micarta—the tough marine plastic.

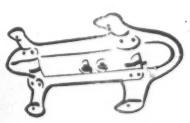
MICARTA HAS HIGH IMPACT STRENGTH, will absorb severe shocks. It will not split or crack.

MICARTA WEARS EVENLY, in many bearing applications has multiplied bearing life 400 per cent.

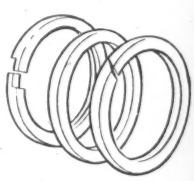
MICARTA IS UNHARMED BY SALT WATER... and reduces galvanic action. Water is its best lubricant.

Micarta marine bearings, as well as countless other applications of Micarta, are produced by Westinghouse—largest laminators of industrial plastics. If these examples of Micarta at work suggest answers to present or postwar problems you have still to solve, consult Westinghouse Micarta engineers. Ask for a personal copy of the new Micarta Data Book B-3184-A. Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

J-06345-A



BOMB RACKS furnish an excellent example of Micarta's strength and intricate molding possibilities.



PUMP RINGS made of Micarta do not soften in service, wear slowly, and will not score cylinder walls.

PULLEYS of Micarta save weight, resist corrosion, extend life of pulleys, chains and cable.

Micarta

Here's a Tip on PLASTICS...

from Your Wife!

IMAGINE YOUR WIFE baking a new kind of cake without a recipe! Or without the exact ingredients the recipe calls for!

Now transpose the situation to plastics—where precision is everything. Here again there's no substitute for the right "recipe" to meet the needs of each plastics application, each group of specific requirements.

Today the mere specification "plastics" is meaningless. Plastics exist in endless variety. Types within types. Each classification joins many desirable qualities. And limitations too. There just isn't any one plastic to meet every need.

We specialize in *thermoplastics*—the cellulosic group—a distinct and versatile class of synthetics covering a wide segment—but a segment, mind you—of the plastics field. This is the group which is the most widely applied to civilian living.

The family name for one group of Celanese plastics is Lumarith, widely known for durability and limitless color range. Included are types of plastics—Lumarith C.A., Lumarith X and Lumarith E.C.—the initials signifying the plastic base. For instance, in these three cases, cellulose acetate, high acetyl cellulose acetate and ethyl cellulose, respectively.

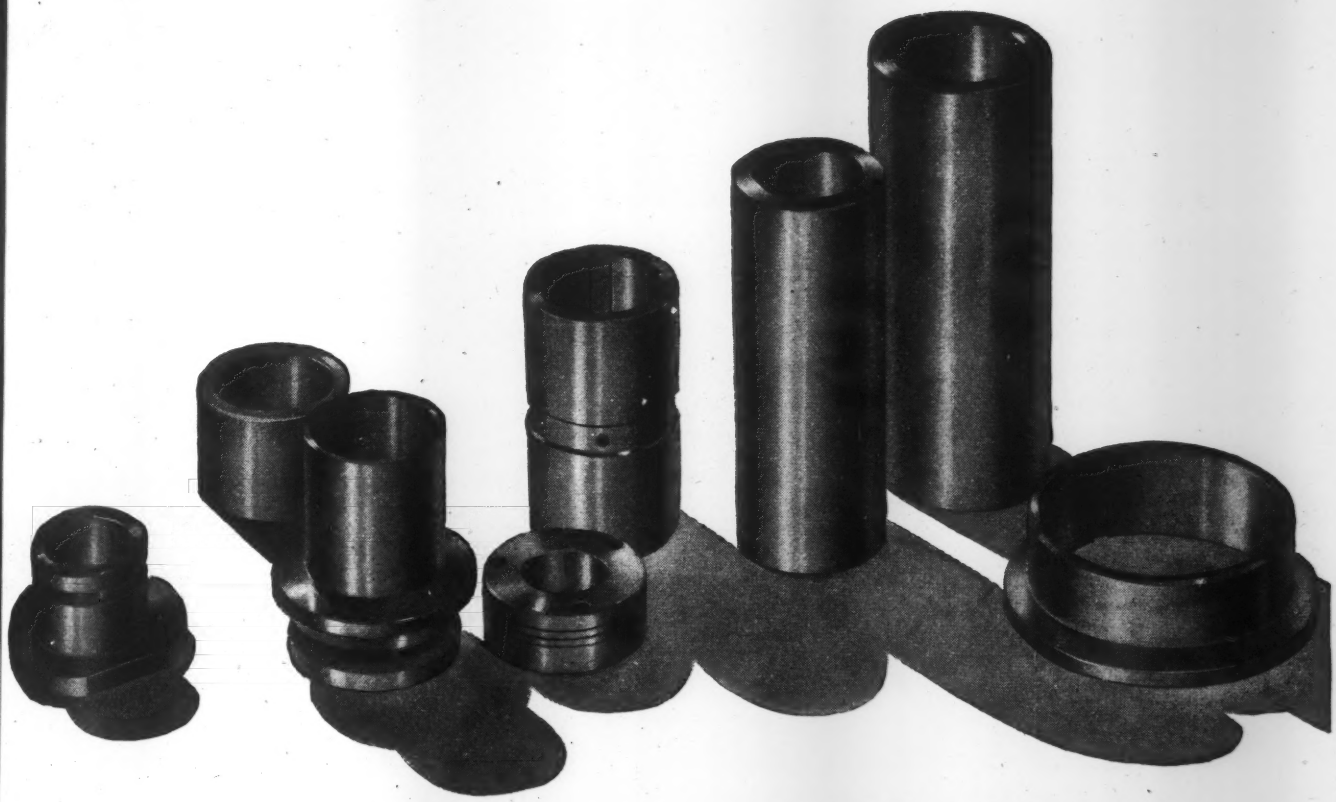
Yet that's only the beginning of precision thermoplastics. The Lumarith C.A. group alone includes hundreds of formulations. Each emphasizes a class of properties in the finished product. Perhaps impact, tensile or structural strength, toughness, heat resistance, moisture resistance, dimensional stability, transparency, color, economical production. All these, and many more, can be had with varying emphasis upon one or more qualities.

Pioneering plastics 75 years ago, the Celanese plastics division has consistently stressed technical service, the key to outstanding results in plastics applications. Painstaking technical service assures precision selection of the right formulations. Architecturally speaking this is fully as important as care in planning the foundation of a building.

The essence of the Celanese technical service is a sense of responsibility for *all* plastics no matter whose. Here, a misapplication of any plastic is considered a "black eye" for the entire industry. We unfailingly commend the best material for the job, and we don't hesitate to rule out Lumarith when another material is indicated. In the interests of better products we suggest you urge your suppliers to talk to our Technical Service Department early in their plans. Celanese Celluloid Corporation, The First Name in Plastics, a division of the Celanese Corporation of America, 180 Madison Avenue, New York 16, N. Y.

LUMARITH* *A Celanese* Plastic*

*Reg. U. S. Pat. Of.



FOR REDUCED FRICTION, EXCELLENT SHAFT CONFORMITY, AND QUALITIES OF SELF-LUBRICATION, SELECT...

BUCKEYE *Lubrico* BEARINGS

...The exceptional quality high lead bearing that resists pounding and heavy shock, yet costs but little more than standard analysis bearings

For precision airplane parts, pumps, seal rings, high speed shafts and other services where freedom from shaft scoring and seizure —and long trouble-free operation are desired, specify "Buckeye Lubrico."

Manufactured from selected metals under Buckeye's exacting laboratory and metallurgical control assures the production of sound homogeneous bearings having a thorough and uniform dispersement of lead throughout. These bearings are free from porosity and are accurately dimensioned within the required limits assuring speedy, easy assembly.

Buckeye Lubrico Bearings can be furnished in any of our 1088 standard stock sizes—in 13″ cored or solid bars—or in any OD, ID and length, slotted, drilled, flanged or threaded exactly to customer's blue-print ... in three different metal analyses to meet exactly the requirements of light high speed, general, and extremely heavy duty service. No order is too big or too small for Buckeye. Let us quote on your requirements.

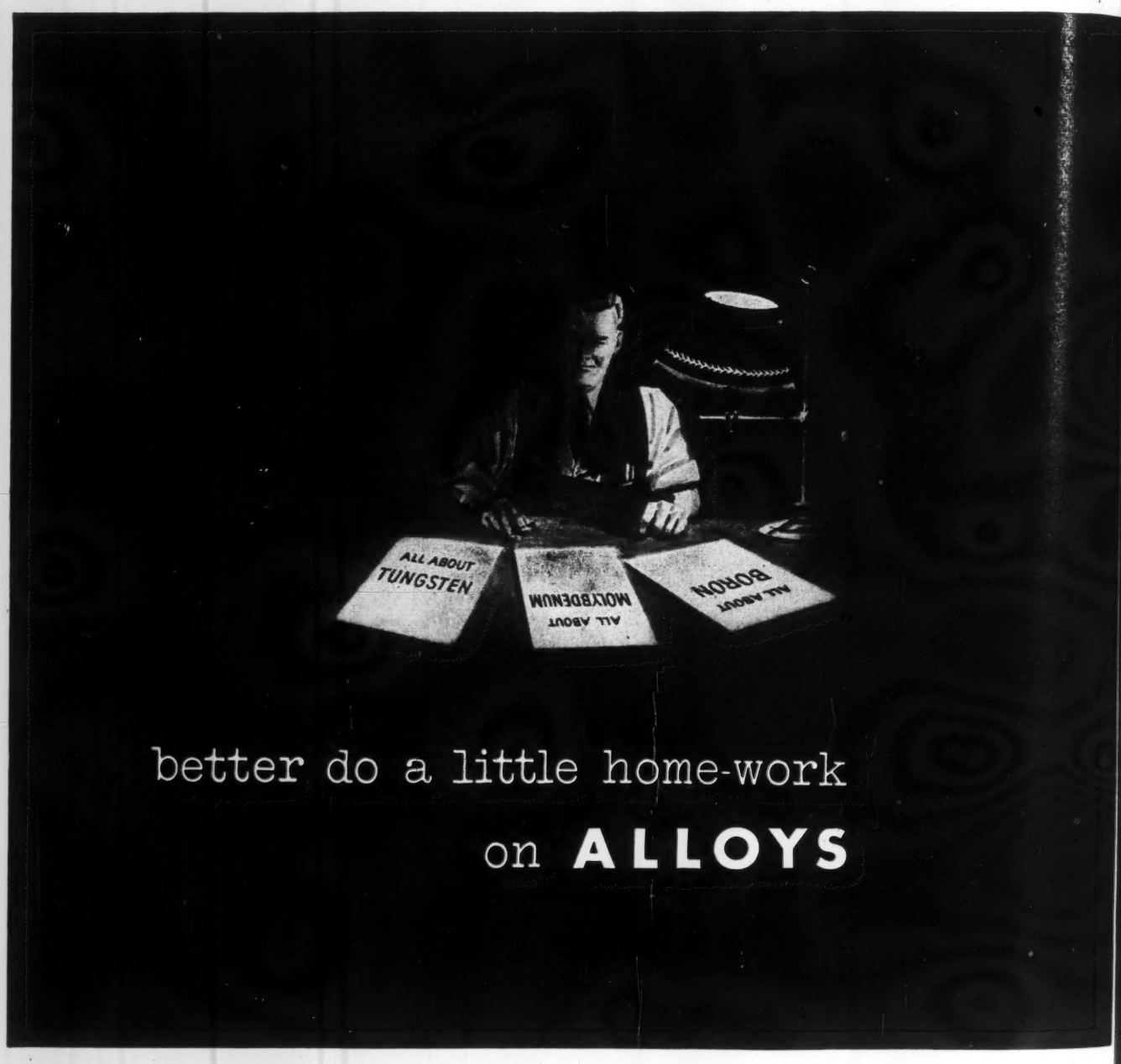
Buckeye

BRASS AND MANUFACTURING COMPANY

BRONZESMITHS SINCE 1900

6412 HAWTHORNE AVE. CLEVELAND, OHIO

BRONZE SLEEVE BEARINGS • STANDARD SIZES OR TO CUSTOMERS' BLUEPRINT IN ANY RECOGNIZED BEARING METAL ANALYSIS

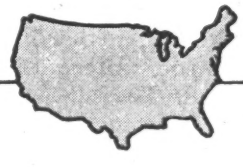


better do a little home-work
on **ALLOYS**

The use of alloys has grown and is growing because the properties of metals for war purposes must go far beyond former requirements, and because alloying materials are now available in ever-increasing amounts, and because new metallurgical knowledge has improved the efficiency and the economy of employing such materials.

The end of the war will not reverse all this. In many quarters, rather, it will intensify competition and the urge to improve production at the lowest possible cost.

Molybdenum, Tungsten, and Boron have all been important to the war economy and each in its own way will be important to the economy of reconversion. The Molybdenum Corporation has prepared helpful information and advice on the most advanced applications of all these three much-discussed elements and the most approved techniques in using them. Correspondence is invited.



AMERICAN Production, American Distribution, American Control—Completely Integrated
Offices: Pittsburgh, New York, Chicago, Detroit, Los Angeles, San Francisco, Seattle.
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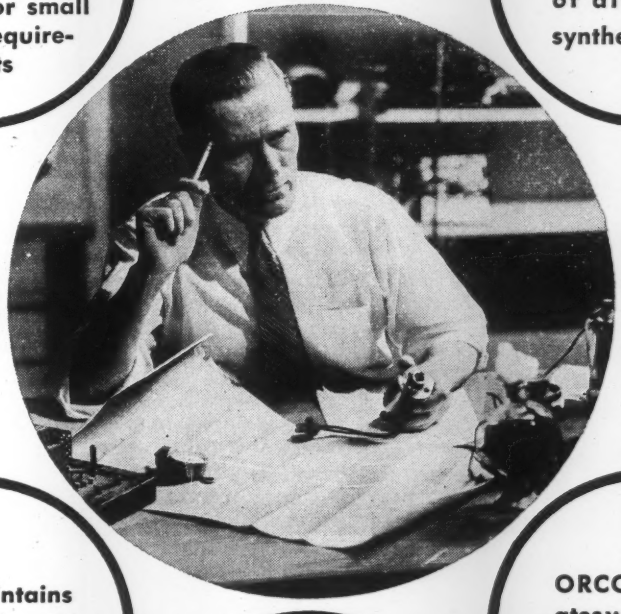
Works: Washington, Pa.; York, Pa.
Mines: Questa, N. M.; Yucca, Ariz.; Urad, Colo.

MOLYBDENUM CORPORATION OF AMERICA
GRANT BUILDING PITTSBURGH, PA.

MCA

Here's How ORCO
"SURROUNDS" PROBLEMS IN RUBBER



1 ORCO keeps abreast of constant changes in the crude rubber situation

2 ORCO conducts continuous study of all types of synthetic rubbers

3 ORCO develops the best compounding ingredients for each type of synthetic

4 ORCO co-operates with leading technical societies in development work

5 ORCO utilizes latest testing methods and laboratory equipment

6 ORCO maintains specialized engineering service on mold designing

7 ORCO maintains engineering staff specializing on tools and equipment

8 ORCO factory facilities are organized and equipped for large or small volume requirements

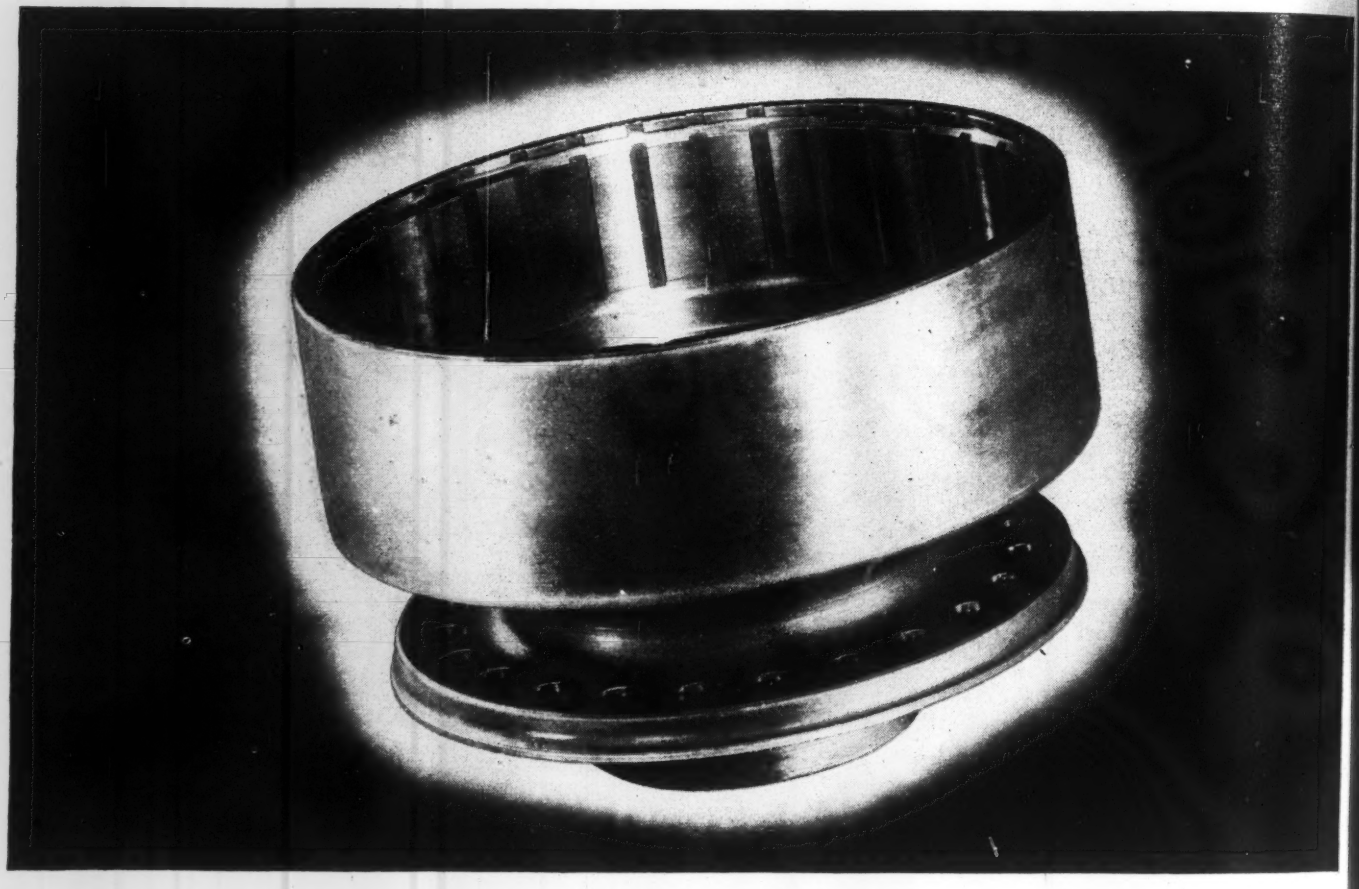
We invite your inquiries on specific problems

"ORCO-OPERATION"

THE OHIO RUBBER COMPANY · WILLOUGHBY, OHIO

BRANCHES: DETROIT • NEW YORK • CHICAGO • INDIANAPOLIS • WASHINGTON • CLEVELAND

This forging helps cut 17 lbs. from the weight of an airplane starter



Weight reduction of any airplane part is a direct contribution to speed and efficiency, yet it must be done without sacrificing strength and stamina.

Through improved design and judicious choice of materials, Jack & Heintz, Inc., of Cleveland, were able to produce a starter weighing 17 lbs. less than previous models, yet even more durable and dependable.

One of the important contributing factors was the use of drop-forged starter bases . . . forged by Phoenix. Formed in closed dies under repeated blows of the mighty forging hammer, the metal takes on added strength through controlled grain flow. As a result, wall thicknesses can be reduced and excess metal eliminated without sacrifice of rugged strength.

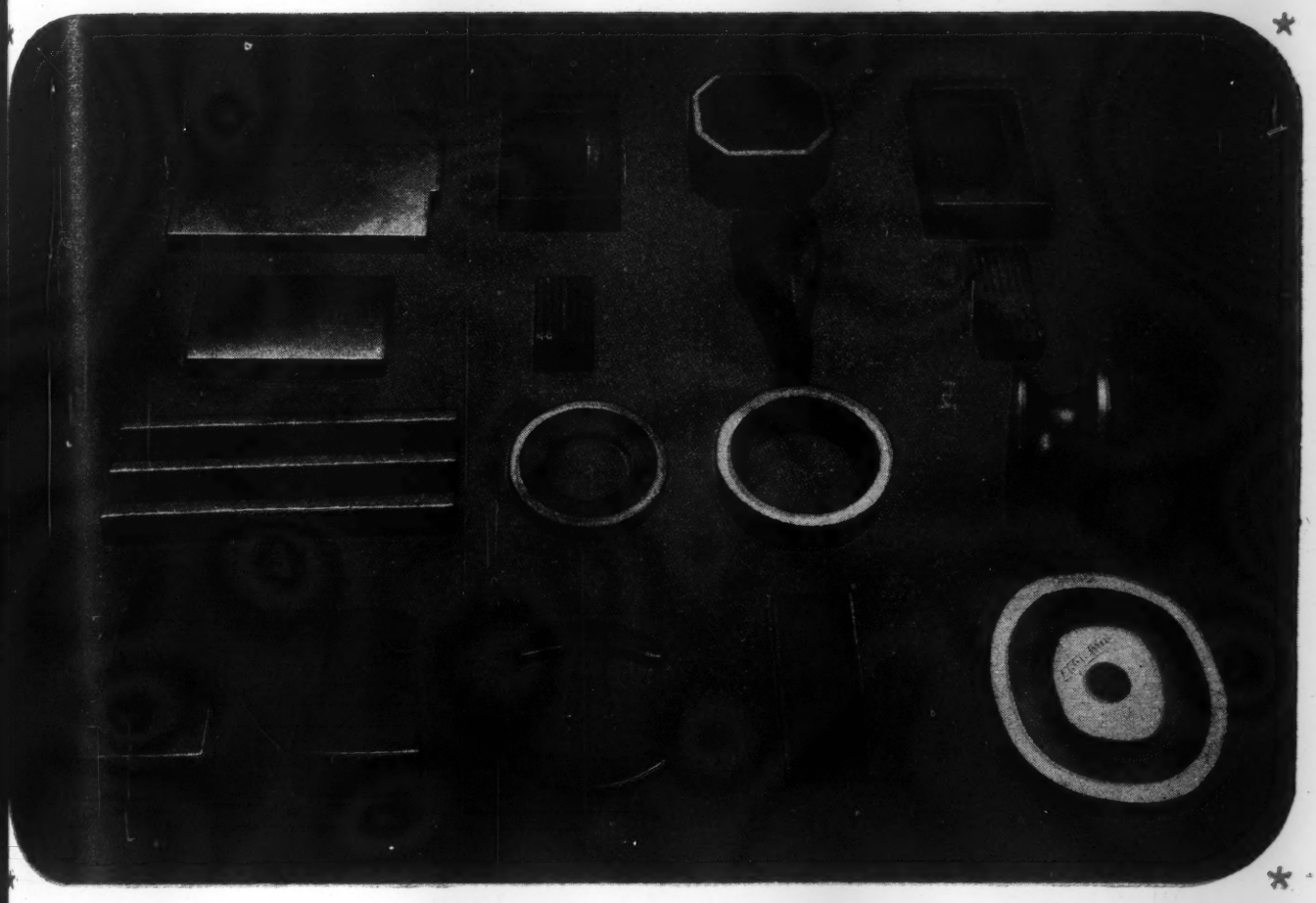
Production economies are also effected by the use of Forgings by Phoenix. Since they can be held to close tolerances, machining is reduced to a minimum, resulting in important savings in man-hours. The advantages of Forgings by Phoenix are equally important to peacetime products and you'll find it to your advantage to discuss your postwar plans with a Phoenix engineer. Write today. There's no obligation.

Forging Division of

PHOENIX MANUFACTURING COMPANY

CATASAUQUA PENNSYLVANIA

Forgings by **PHOENIX**



START WITH YOUR JOB *Half Finished*

WHEN it's dies you're making—small or large—or various other forming tools or gages or certain fast-wearing parts of machines, FCC Tool Steel Cast To Shape can really save you money.

Very intricate shapes can now be cast in one piece within an eighth-inch of finished size. This means that you pay for less steel to begin with, and reduce machining time substantially.

Air Hardening, Oil Hardening and special Hot Work Tool Steels of various grades—each a thoroughly dependable performer in its class—are available in this modern, economical form.

Prompt delivery under CMP.

WRITE FOR THIS BOOKLET

FCC PRODUCTS AND SERVICES

It contains details of FCC Tool Steels Cast To Shape and of other important Forging and Casting Division specialties that may offer you money-saving production ideas. Get your copy—write for it today.

Address Dept. MD-25

W&D...9478

AL STEEL FOR THE NATION'S WELFARE

Allegheny Ludlum
STEEL CORPORATION
Forging and Casting Division
DETROIT 20, MICHIGAN

Meeting the Postwar Challenge with Steel

War-born improvements in steel are a vital factor in supplying the countless items of new equipment needed by Allied land, sea and air fighters.

How will these improved steels affect your postwar picture? How largely should they figure in your planning?

THE countless new uses of steel-at-war enable it to play a major part in every theatre of action. Its battle-proved versatility leaves no doubt about the important place steel will take when manufacture of peacetime goods is resumed.

Many of the new developments, which have made steel the backbone of war, were originated by our metallurgists. Improved toughness, hardness and strength —greater resistance to heat, corrosion, abrasion and impact shock—these are some of the qualities which have won world-wide recognition for U·S·S Steels.

Through the most comprehensive advertising effort the steel industry ever has seen, U·S·S Steels are winning an acceptance which will help you meet postwar conditions. This promotion will continue to back you at every step.

Let us share in planning your postwar products. Our contribution will be the specialized knowledge of our technical staff, who will be glad to consult with you on your many and varied problems. Drop us a line today—this cooperation is offered freely, without any charge or obligation. Check this list of U·S·S Steels for Design. See how their special properties can meet your postwar needs.

War-Tested U·S·S Steels for Your Peacetime Products

U·S·S HIGH STRENGTH STEELS *to resist corrosion and increase strength without adding weight.*

U·S·S COPPER STEEL *to give at least twice the atmospheric corrosion resistance of regular steel at little additional cost.*

U·S·S HOT-ROLLED AND COLD-ROLLED STEELS *to provide the basic advantages of steel, plus maximum economy in accordance with the needs of each job.*

U·S·S ABRASION-RESISTING STEEL *to combat wear and friction.*

U·S·S STAINLESS AND HEAT-RESISTING STEELS *to assure high resistance to corrosion and heat, and to reduce weight.*

U·S·S CARILLOY ALLOY STEELS — *Special Steels for the special jobs of industry.*

U·S·S PAINTBOND—*A galvanized, Bonderized sheet that permits immediate painting and holds paint tighter.*

U·S·S VITRENAMEL—*Sheets designed especially for porcelain enameling.*

U·S·S ELECTRICAL SHEETS *for motors, generators and transformers.*

CARNEGIE-ILLINOIS STEEL CORPORATION

Pittsburgh and Chicago

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
United States Steel Supply Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

USS

ONLY STEEL CAN DO SO MANY JOBS SO WELL

UNITED STATES STEEL

FOR THE ULTIMATE IN *Lightness..*

Magnesium Extruded Shapes

Couple the extrusion method of manufacture with the natural lightness and high strength of magnesium for a weight-saving combination that's hard to beat. Magnesium extruded shapes let you achieve the ultimate in lightness with safety and economy.

In extruded magnesium shapes, the metal can be placed exactly where needed. No wasteful, weight-adding excess to satisfy the limitations of a manufacturing method. Note how the bus top-rail section pictured above provides for its own assembly into the structure and for addition of top and side sheets. The necessity for building up sections by riveting or welding is avoided.

Magnesium extruded shapes and other products are now available through American Magnesium Corporation for purposes authorized by W.P.B. Our representatives will gladly assist you in meeting your requirements. Aluminum Company of America (Sales Agent for American Magnesium Corporation) 1703 Gulf Building, Pittsburgh 19, Pennsylvania.

MAGNESIUM MAZLO PRODUCTS

AMERICAN MAGNESIUM CORPORATION

SUBSIDIARY OF ALUMINUM COMPANY OF AMERICA

Specify Lebanon CIRCLE L 21 for Weldments...

CORROSION-RESISTANT QUALITIES UNALTERED BY WELDING HEAT

MORE and more industries are taking advantage of the economies offered by weldments—composite units produced by the welding together of several castings. However, the size and shape of many of these structures prohibit post-welding heat treatment—a practice normally used to restore corrosion-resistant qualities lost through application of heat during welding.

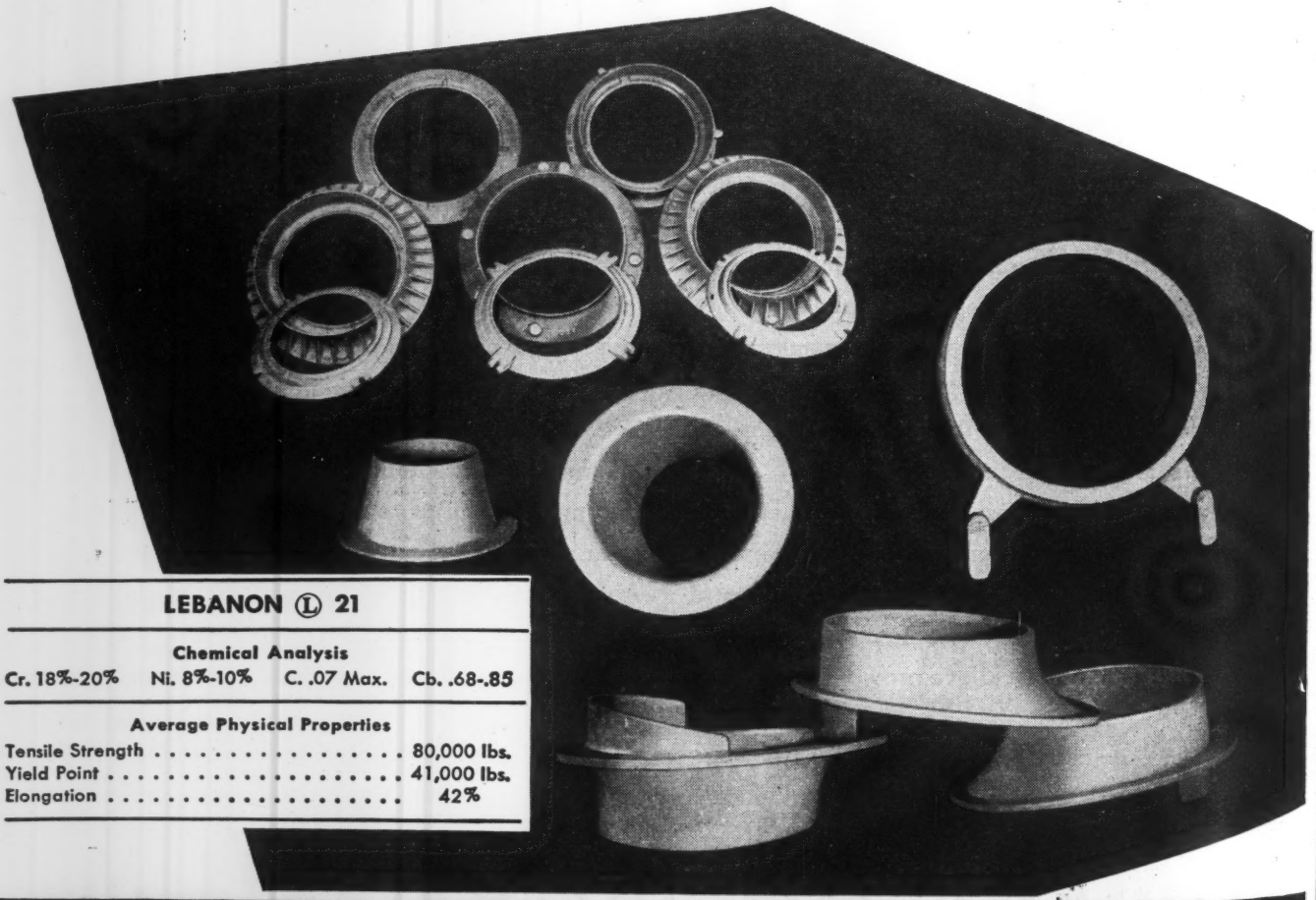
The best solution of this problem is the use of a casting alloy that loses none of its corrosion resistance during the welding process. Lebanon has developed such an alloy in Ⓛ 21. Through the addition of columbium, this 18% chrome and 8% nickel steel is stabilized against the action of welding heat.

In austenitic 18 and 8 alloys, the remarkable affinity of columbium for carbon forms a stable columbium carbide constituent. This constituent protects against carbide precipitation and inhibits inter-granular corrosion. As a result, when heat is applied to Lebanon Ⓛ 21 during welding, the corrosion resistant qualities of this steel are retained intact. The need for post-welding heat treatment is eliminated.

Induction melting of Lebanon Ⓛ 21 permits close analytical control. It meets U. S. Navy Specification 46S27 for resistance to salt water as well as the corrosion requirements of a great variety of chemical, food, textile, petroleum and other processing equipment.

LEBANON STEEL FOUNDRY **LEBANON, PA.**

ORIGINAL AMERICAN LICENSEE GEORGE FISCHER (SWISS CHAMOTTE) METHOD



LEBANON Ⓛ 21

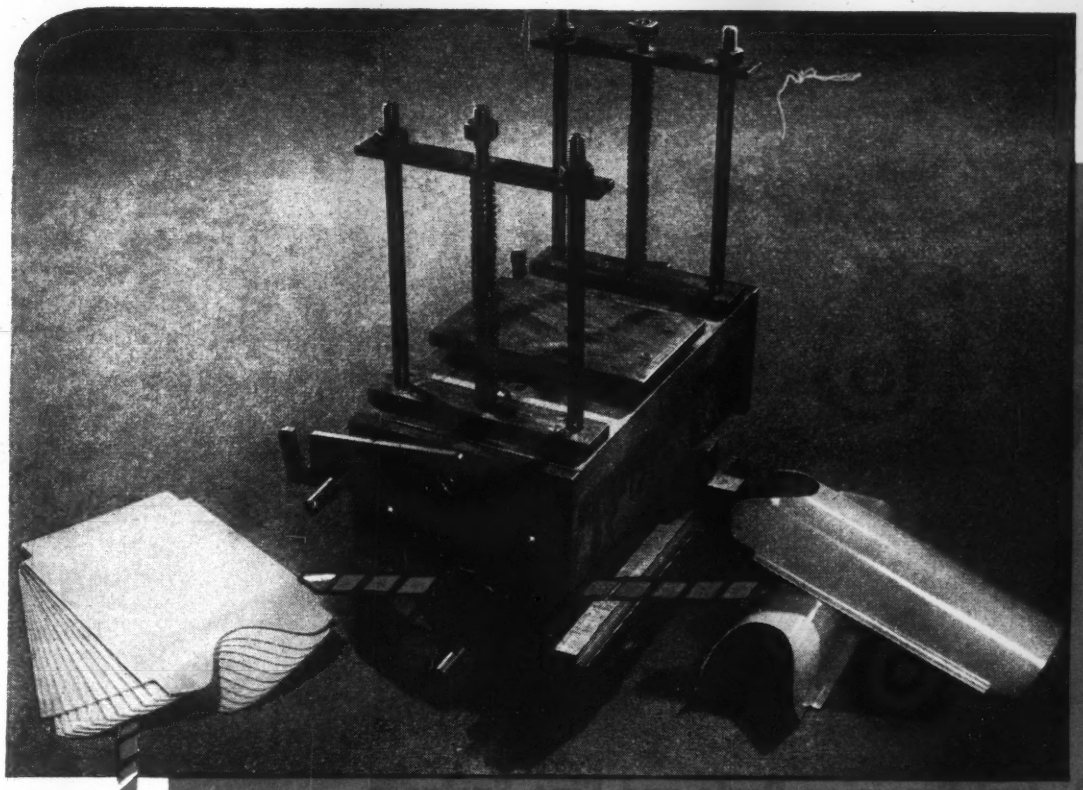
Chemical Analysis

Cr. 18%-20%	Ni. 8%-10%	C. .07 Max.	Cb. .68-.85

Average Physical Properties

Tensile Strength	80,000 lbs.
Yield Point	41,000 lbs.
Elongation	42%

LEBANON CIRCLE L *Stainless and Special Alloy* **STEEL CASTINGS**



IT'S AS SIMPLE AS THAT!

YOU heat a finished and fully cured Formica sheet by any quick method. While still hot you swing it into a press with wooden or Pregwood forms and form it instantly into shape. When it cools, it holds that shape.

That, in the briefest outline, is all there is to the important new method of forming Formica sheets for the production of shapes which just a little while ago no one thought were possible for that material.

A sheet can be formed to any inside radius no smaller than its thickness. The method is one any production man likes—it works fast, it is accurate; there is a minimum of rejections and waste.

The discovery of this forming procedure adapts the material to many uses for which it was formerly thought to be unadaptable . . . Let us give you all the facts.

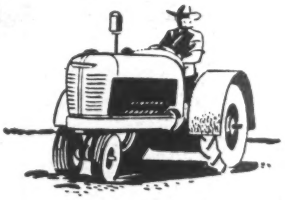
FORMICA

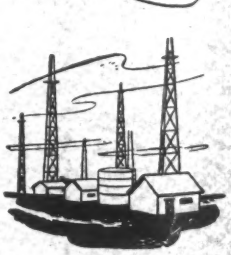
THE FORMICA INSULATION CO., 4648 SPRING GROVE AVE., CINCINNATI 32, OHIO

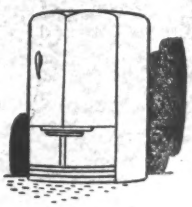
Safeguard Product Performance with

MORAINE POROUS METAL

(Commonly known as POREX)







Filter Out Harmful Particles—
Separate Undesirable Fluids—
Protect Precision Parts and Fine Surfaces

If your product by the very nature of its design requires a clean actuating or lubricating medium, such as fuel, air or oil, you should by all means investigate Moraine Porous Metal, commonly known as Porex.

To put it simply, this unique metal can be put to work where it is desirable to *keep something out* and *let something else in.* Examples: A *filter* element to protect fine orifices of Diesel injector nozzles from dirt in the fuel, or to protect bearings from dirt in lubricating oil; a *separation* element to remove oil from the refrigerant; a *breather vent* to allow for motor breathing and at the same time prevent a spark from igniting combustible air outside an explosion-proof electric motor.

Whether the function is filtration, separation, diffusion or flow control, Moraine Porous Metal (Porex) provides exceptional efficiency because of its *tortuous flow passages*—the result of unique structure attained by powder metallurgy. Moraine Products Division, General Motors Corporation, Dayton, Ohio.

WAR BONDS SAVE LIVES

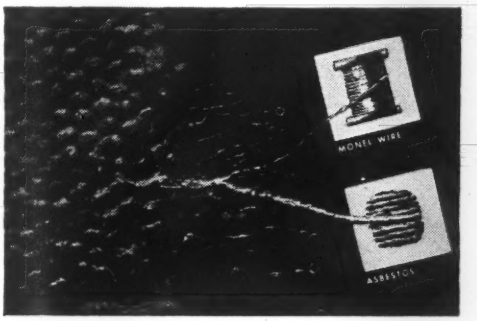
MORAINE PRODUCTS DIVISION OF GENERAL MOTORS

DAYTON, OHIO

They wanted resistance to

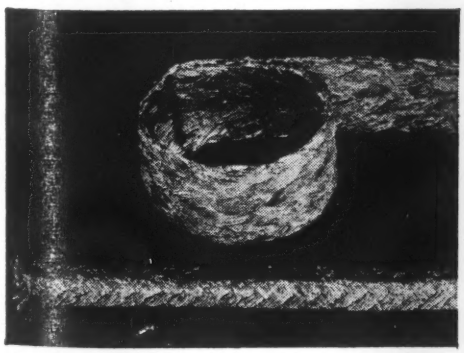
Shivering

AT 850° to 2000° F.



ASBESTOS WITH BACKBONE . . .

and the backbone is made of twin strands of .007" Monel. Devised by Johns-Manville engineers, the yarn is woven into Naval turbine insulation that withstands incessant "shivers" at 850° F. The Monel also gives the necessary resistance to the corrosive sea-air moisture, soaked up by the asbestos.



RESISTS "SHIVERS" AT 2000° F.,

another Johns-Manville product. Fine Inconel wire is knit into mesh, then combined with asbestos to make a packing that seals in the white-hot corrosive leaded gas fumes which drive the superchargers on high-flying warplanes.

. . . and combinations of asbestos with INCO Nickel Alloys produced materials with all the properties they needed . . .

There seems little kinship between insulation for warship turbines and exhaust packing for warplanes.

Yet the two have much in common. Both materials face a similar three-pronged attack of:

High Temperatures up to 850° F. for the turbine insulation; and 2000° F. for the exhaust packing.

Incessant Shivering. The destructive vibration set up by powerful engines and turbines.

Corrosive Atmospheres. Corrosive sea air attacks the turbine insulation. Corrosive white-hot gas fumes attack the exhaust packing.

No known material, by itself, would serve satisfactorily. Asbestos, used alone, would shiver to pieces under the combination of intense vibration and high temperatures encountered.

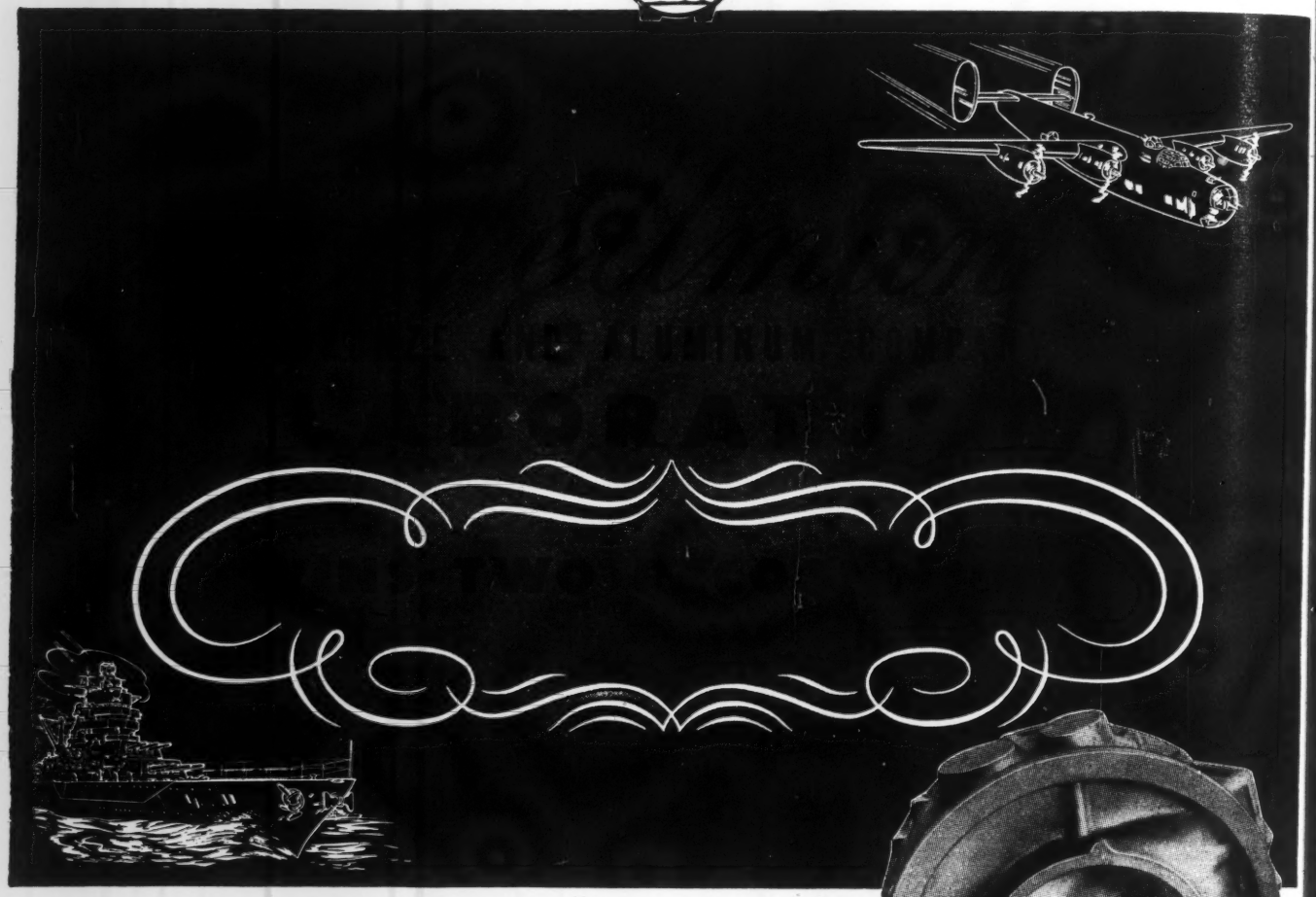
Johns-Manville engineers, faced with the problems, set out to give asbestos "backbone." They did this, after much experimentation, by combining it with strong, tough corrosion-and-heat-resistant INCO Nickel Alloys. Photographs of the insulation and packing are shown with details of their fabrication.

One of these very materials may be the answer to some similar problem facing you. Or one of the INCO Nickel Alloys may solve an entirely different metal problem . . . as it has solved many others . . . where a combination of strength, toughness, corrosion resistance and other specialized properties are required. For further information, feel free to call upon INCO Technical Service. Address:

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street **New York 5, N. Y.**

NICKEL (INCO) **ALLOYS**

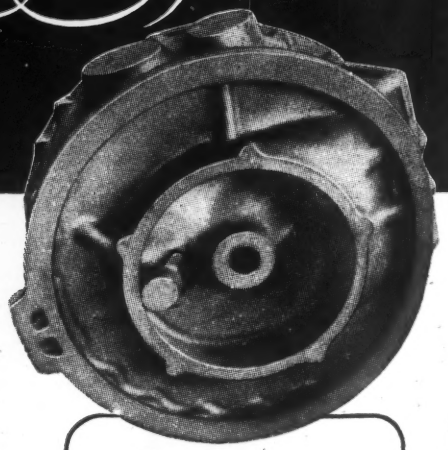
MONEL • "K" MONEL • "S" MONEL • "R" MONEL • "KR" MONEL • INCONEL
"Z" NICKEL • NICKEL • *• Sheet . . . Strip . . . Rod . . . Tubing . . . Wire . . . Castings*



Evidence of the capabilities of our laboratory personnel and quality of our equipment is contained in the following laboratory recognitions:

1. Certification for Radiography by the Air Force (this distinction won in 1943).
2. Being placed on the Navy Department's list of Approved Private Chemical Laboratories (early in 1944).

Here is further proof of the ability of our company to meet your rigid requirements.



Castings in
ALUMINUM
(Heat Treated)
MAGNESIUM
AMPCO BRONZE
BRONZE • BRASS
•
Patterns in Metal and Wood.
•
WELLMAN
***Means* WELL-CAST**

THE WELLMAN BRONZE & ALUMINUM COMPANY
GENERAL OFFICES:
2547 EAST 93rd STREET • CLEVELAND 4, OHIO
CASTINGS *X-RAY INSPECTED*

That's a TRICK, Mr. Jones ...and we know it!

PLASTIC MATERIALS, you know, vary considerably. Not only in regard to physical properties *after* molding, but in regard to molding behavior as well. In other words, your plastic part has to be designed in full recognition of your material. That's why we say that the selection of material is another job for your custom molder!

But Kurz-Kasch does more than team up these two functions. In growing up with the plastics industry, we've found it wise to insist that experts on mold-making, molding and finishing add their opinions during the planning stage. This way, you can rest assured that your job will be estimated right—produced right—and delivered right on schedule.

This service is available from the moment you first wonder if plastics will fit into your program. In fact, that's the time to get the most out of it. We urge you to feel free to use it—now!

Why Kurz-Kasch for Plastics? Kurz-Kasch offers a 28-year-old reputation for thoroughly engineered, quality production. • One of the largest, best-equipped exclusive custom molding plants in the country—75,000 square feet of floor space with 125 compression and transfer presses of all sizes.

Complete mold-making and finishing facilities • Extensive production sequences of radio-frequency preheating equipment, with full experience in their use. Completely equipped shop for production of inserts • For satisfaction in plastics, key these facilities into your production line.

BUY BONDS! ALL YOU CAN — WHENEVER YOU CAN

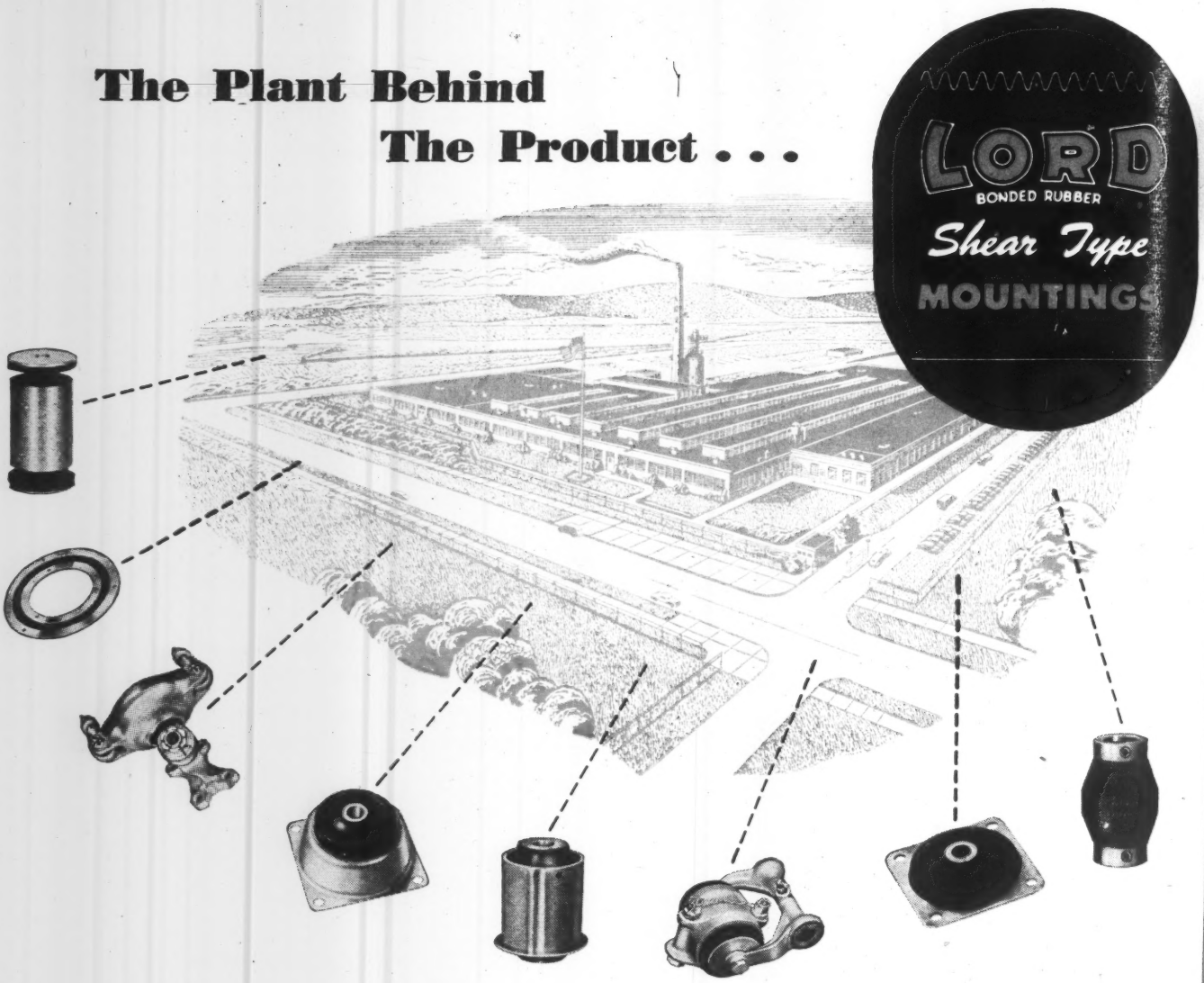
KURZ-KASCH

For over 25 years Planners and Molders in Plastics

Kurz-Kasch, Inc., 1423 South Broadway, Dayton 1, Ohio

Branch Sales Offices: New York • Chicago • Detroit • Indianapolis • Los Angeles • Dallas St. Louis • Toronto, Canada. *Export* Offices: 89 Broad Street, New York City

The Plant Behind The Product . . .



AN idea that was born over twenty years ago; an idea that was painstakingly developed on reams of paper covered with engineering formulas, drawings and mathematical computations; an idea that was proven in countless laboratory tests. That idea accounts for the fact that Lord has had to make three additions in as many years, to take care of the war-time demand for the best in vibration control mountings for airplanes, ships, tanks, and a hundred other tools of war.

The idea was that a Shear Type Mounting, properly designed, is vastly superior in vibration control to compression or tension type mountings. The work on paper and in the laboratory has continued; it has included designs for thousands of different jobs; it has included methods of bonding rubber to practically every industrial metal; it has included exhaustive tests of *natural rubber and synthetic rubber* of varying compositions and degrees of stiffness.

It has all resulted in Lord being the authority on vibration control and isolation. When a tough vibration problem comes up, the typical expression heard from the designer, the engineer, the shop superintendent is, "Send it to Lord".

Because Lord knows, there is a solution to your vibration problem. Perhaps it's in our free literature; perhaps you would do well to call in a Lord Vibration Engineer. No obligation attached to either service.

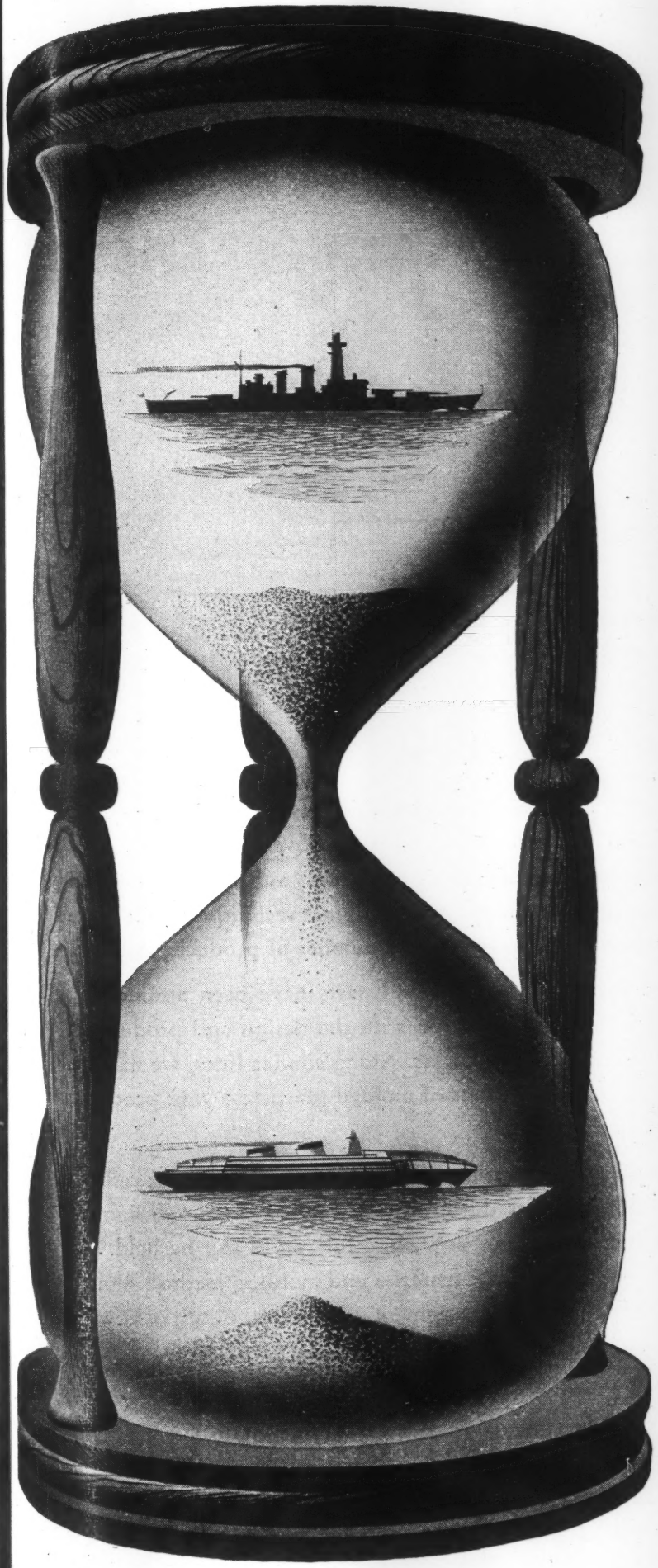
IT TAKES RUBBER *In Shear* TO ABSORB VIBRATION

LORD MANUFACTURING COMPANY
ERIE, PENNSYLVANIA

SALES REPRESENTATIVES
NEW YORK - - 280 MADISON AVE.
CHICAGO - 520 N. MICHIGAN AVE.
DETROIT - - 7310 WOODWARD AVE.
BURBANK, CAL. - 245 E. OLIVE AVE.
CANADIAN REPRESENTATIVES
RAILWAY & POWER ENGINEERING CORP., LTD.
TORONTO, CANADA

Originators of Shear Type Bonded Rubber Mountings

Do More Than Before—Buy EXTRA War Bonds



WILCO facilities Expanded to Meet Wartime Needs!

But Postwar Industry will be the ultimate gainer from the many new WILCO products and developments

As the Hourglass indicates . . . at the coming of peace, the skill and experience gained in the development and application of new WILCO products and techniques will mean much to automotive, electrical appliance and many other types of manufacturing customers.

Though now chiefly applied to the war effort, these new WILCO developments are destined to play as vital a role in the postwar industrial "comeback" as they are now playing in scores of wartime applications.

Thermostatic Bimetals, Electrical Contacts, and Precious Metal Bimetallic Products are such important factors in the precision performance of ships, planes, tanks, guns, and various instruments of the Army and Navy that the H. A. Wilson Company has found it necessary to enlarge its facilities and develop these important new products and techniques.

In the postwar period no company will be better equipped to meet individual requirements for Thermostatic Bimetals and Electrical Contacts on any desired scale than the H. A. Wilson Company, pioneers in this field.

WILCO PRODUCTS ARE: *Contacts*—Silver, Platinum, Tungsten, Alloys, Sintered Powder Metal. *Thermostatic Metal*—High and Low Temperature with new high temperature deflection rates. *Precious Metal Collector Rings* for rotating controls. *Silver Clad Steel. Jacketed Wire*—Silver on Steel, Copper, Invar, or other combinations requested. *Silver Clad Steel. Rolled Gold Plate.* Special Materials.

THE H. A. WILSON COMPANY
105 Chestnut Street, Newark 5, New Jersey

WILCO

Thermometals—Electrical Contacts
Precious Metal Bimetallic Products

"CAN IT BE IMPROVED...WITH PLASTICS?"

This question does not presuppose that plastics is the magic "cure-all." On the contrary it rules out the lady-luck influence as irrelevant to the problem.

"Can it be improved with Plastics?" is the number one question in any consideration of engineered plastics for a product or part.

Our engineers are trained to consider plastics in relation to the requirements of a product and the improvement desired. They have an appreciation of the complementary values of plastics and metals and have developed some original techniques with these combinations which have solved a number of product problems.

Improvements in products and parts have been attained by us through close collaboration with the design and production staffs of aircraft manufacturers. Along similar lines, we may be able to suggest applications of molded plastics to your products ... present or planned.

For the right application of plastics to your product, call on Plastic Manufacturers during the design stage. The design of your product determines how close tolerances can be held. Selection of the right plastic material and molding method should be left to our experienced judgment. Send for free copy of Folder File MD10, describing our facilities.

PM

THE SYMBOL OF
ENGINEERING EXPERIENCE
AND MOLDING SKILL

REPRESENTATIVES

DETROIT 2
805-06 NEW CENTER BLDG.

•

NEW YORK 1
19 W. 34TH ST.

•

LOS ANGELES 35
1440 SO. ROBERTSON BLVD.

•

CANADA
A. & M. ACCESSORIES LTD.
19 MELINDA ST., TORONTO
744 W. HASTINGS ST.
VANCOUVER
1405 BISHOP ST., MONTREAL

PLASTIC MANUFACTURERS

INCORPORATED

STAMFORD, CONNECTICUT

ENGINEERED PLASTICS FOR INDUSTRIAL APPLICATIONS

MOLD MAKING • INJECTION & TRANSFER MOLDING • COMPLETE ASSEMBLY

THERE was a time when a wire coat hanger was just a handy gadget to hang clothes on. You took 'em for granted. Dozens accumulated in every closet. Tailors and dry cleaners included them free with every suit that came back from a pressing. But not anymore.

It's an interesting fact that coat hangers, like bobby pins, fly swatters and paper clips, have become so hard to get lately. Their growing scarcity has made people realize how indispensable to modern living are the many commonplace products that are best when made of steel wire. They've been sorely missed on the home front. They're due for a big welcome when wire comes back from the wars

Manufacturers Wire has been improved by War Service

We've learned a lot about making wire better during these war years. We know how to turn it out faster and in greater quantities. New and better steels have been developed to give wire even greater versatility. To make it more ductile, stronger, stiffer —easier to fabricate.

All this means that as more wire is released for civilian manufacturing you'll find American Quality Wire better able than ever before to do a better job for you.

Right now is not too soon to plan to include this superior wire in your products of tomorrow. Our wire specialists and product research men have accumulated a lot of good ideas that you may find very helpful. Their cooperation is at your service.

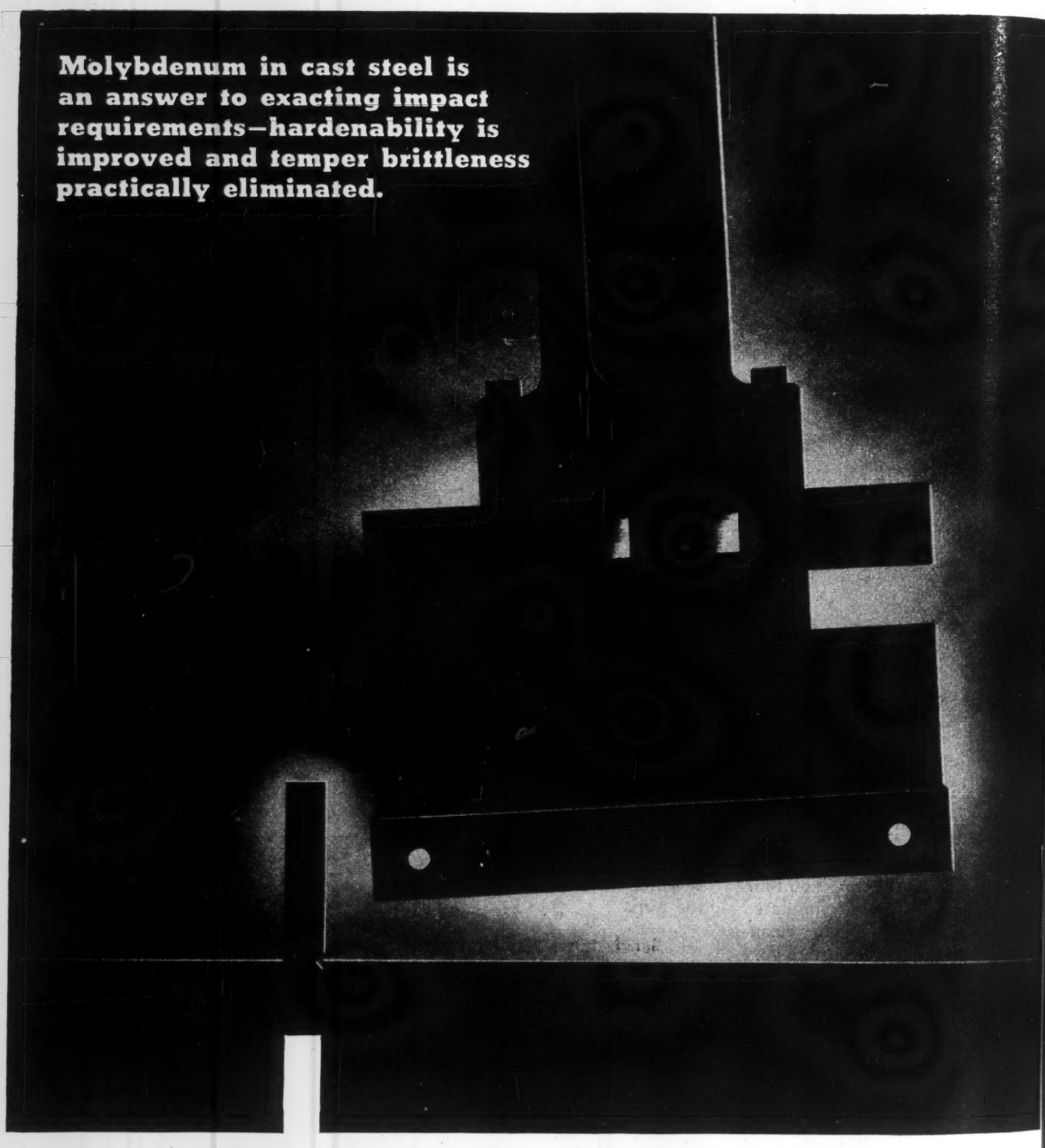
AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
United States Steel Export Company, New York

USS
AMERICAN
Quality
MANUFACTURERS
WIRES

UNITED STATES STEEL



CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.

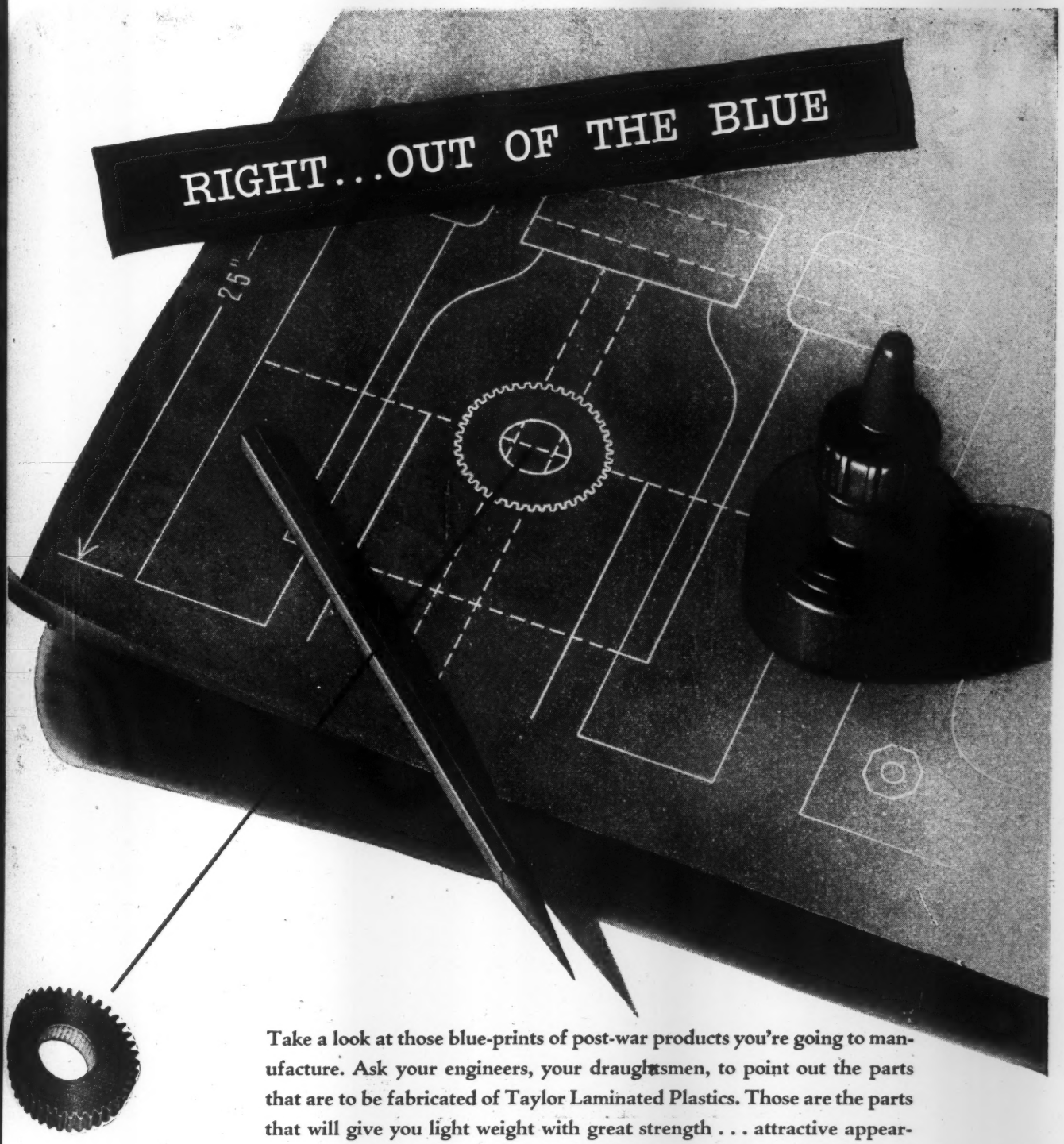
ARMY E NAVY

MOLYBDIC OXIDE, BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

Climax Molybdenum Company

MOLY

500 Fifth Avenue · New York City



Take a look at those blue-prints of post-war products you're going to manufacture. Ask your engineers, your draughtsmen, to point out the parts that are to be fabricated of Taylor Laminated Plastics. Those are the parts that will give you light weight with great strength . . . attractive appearance . . . unsurpassed insulating qualities . . . the characteristics required for extreme machining at high speeds . . . the necessary resistance to moisture and solvents . . . the economy of speedy mass-production that will be vital in meeting post-war competition.

Submit your blue-prints to Taylor with the confident knowledge that Taylor's recommendations will be right . . . out of the "blue." Do it now.

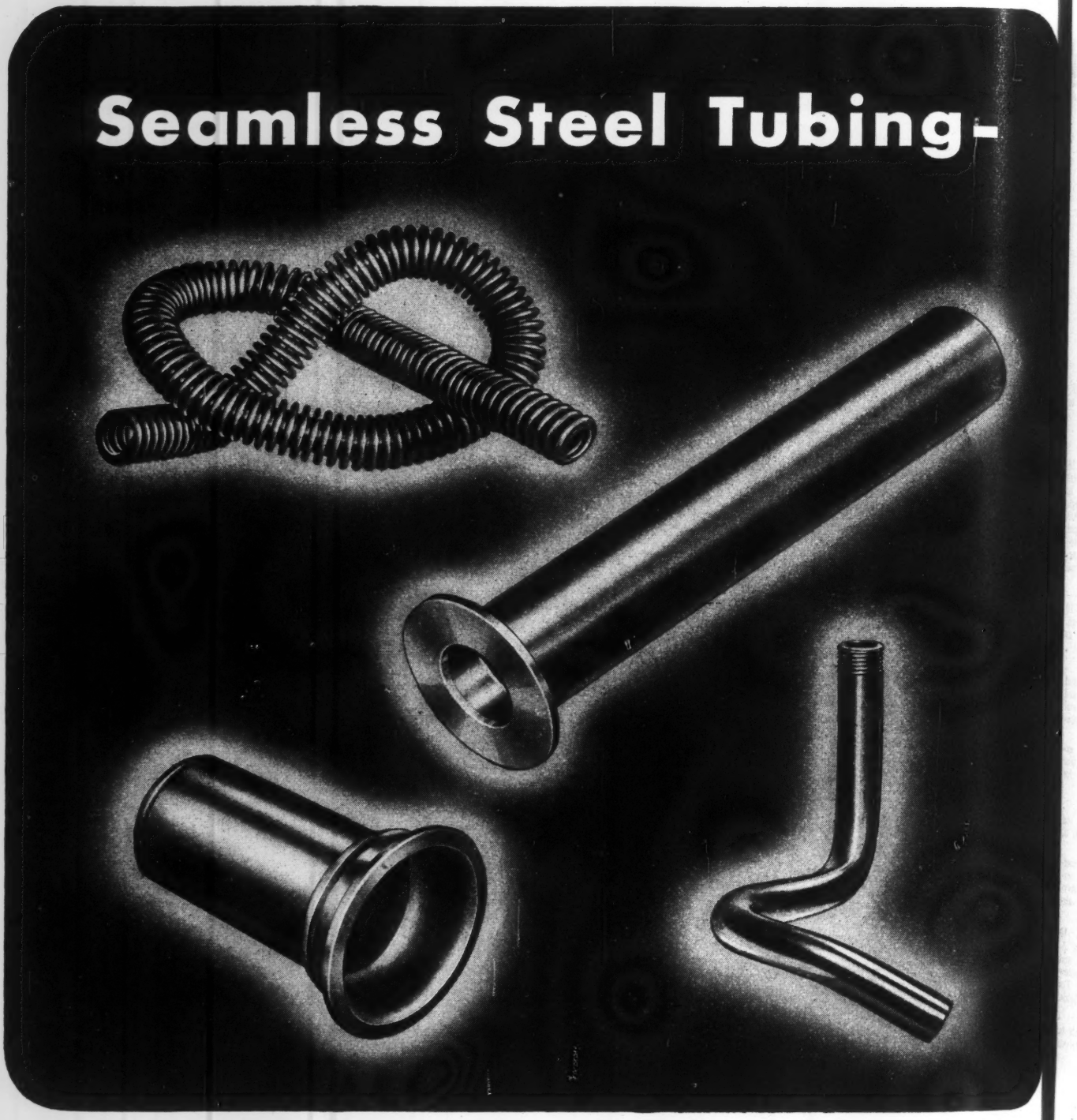
POST-WAR-PLANNING DEPARTMENT OF

TAYLOR FIBRE COMPANY

LAMINATED PLASTICS: PHENOL FIBRE • VULCANIZED FIBRE • Sheets, Rods, Tubes, and Fabricated Parts

NORRISTOWN, PENNSYLVANIA • OFFICES IN PRINCIPAL CITIES • PACIFIC COAST HEADQUARTERS: 544 S. SAN PEDRO ST., LOS ANGELES

Seamless Steel Tubing-



is "Raw Stock" for many Parts

As raw stock for many mechanical parts, Seamless Steel Tubes can be delivered in diameters, wall thicknesses and with properties to require only finishing operations.

Repeated drawing and annealing under carefully controlled conditions refines MICHIGAN "mechanical" tubing to the characteristics required for machining, threading, up-setting or any other working specifications.

Feel free to consult us on your tubing requirements.

MICHIGAN SEAMLESS TUBE COMPANY

SOUTH LYON • MICHIGAN

DIRECTORY OF MATERIALS

Demands of wartime industry have greatly accelerated the pace of research in improving familiar engineering materials and developing new ones. Thus the designer's need for "finger-tip" facts on the properties and characteristics of all such materials takes on greater importance than at any time in the past.

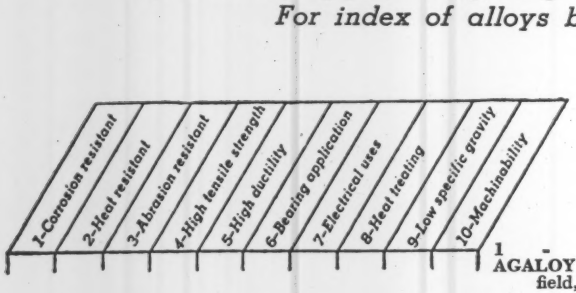
To facilitate selection of materials of all types in this Twelfth Edition of MACHINE DESIGN's directory, the outstanding properties of each are classified by a convenient numerical key placed above the tradename listings. Where numerals are shown only on the line immediately above the tradename, all types or grades produced under that tradename possess the properties designated by the numerals. When properties vary with the grades, classifying numerals appear above each individual grade to designate the three major properties of each.

To indicate possible alternative materials as a further aid in selection, cross-reference listings are provided. These appear immediately following the tradename listings of metals and nonmetallics respectively. The cross reference on metals is based on alloying constituents while the one on nonmetallics is arranged by specific types of material. In addition, all listings are cross referenced under the names of producers.

Many new listings of metallics and nonmetallics are included in the current directory, as well as complete revisions of materials data which appeared in earlier editions. The sections on stampings, forgings, die castings, finishes and custom molders also have been considerably enlarged.

Iron, Steel and Nonferrous Metals Listed by Tradenames

(For listing by producing companies, and complete street addresses, see Page 204. For index of alloys by principal constituents, see Page 200)



A

1 - 3 4 - - - - - - -
ABRASOWELD—Lincoln Electric Co., Cleveland. Arc-welding electrode for providing abrasion-resisting, self-hardening deposit which hardens rapidly under impact and abrasion; maximum hardness develops at surface, leaving cushion of softer metal beneath. Provides resistance to abrasion in straight carbon, low alloy or high manganese steel surfaces; effective on gear and pinion teeth.

1 2 - - - - - - 8 - -
ACCOLOY—Alloy Casting Co., Champaign, Ill. Analysis ranges from 18 per cent chromium, 8 per cent nickel to 68 per cent nickel and 10 per cent chromium. Furnished in wire, sheets and castings. It is nonmagnetic, and heat resistant to 2300 deg. F. Weldability, good; abrasion resistance, low. Used for corrosion resistant applications such as pump parts, tubing, chemical processing furnaces, etc., where resistance to corrosion and/or temperature is required.

- - - 4 5 6 - - - -
ACORN—A. W. Cadman Mfg. Co., Pittsburgh. Babbitt metal furnished in ingots; Bhn, at 70 deg F, 23.8; 212 deg F, 21.8; compressive strength, 12,500 psi. For bearings having reciprocating motion, subject to excessive pound or vibration.

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ADAMANT SUPER-GENUINE BABBITT—Magnolia Metal Co., Elizabeth, N. J. Over 90 per cent tin, free of lead, containing special fluxes; furnished as ingots; sp. gr., 7.34; bearing properties, good; Bhn, untreated 23. Used for bearings, diesel engines, connecting rods, etc., subject to shock or strain.

- - 3 - - - - - - -
ADAMANTINE—Babcock & Wilcox Co., New York. Special steel castings with wear-resisting qualities and machinable surfaces. For grinding mills, mixers, conveyors, power shovels.

See advertisement, Pages 298, 299

- 2 - - - - 7 - - -
ADVANCE—Driver-Harris Co., Harrison, N. J. Copper 55, nickel 45; resists heat to 1500 deg F; thermocouple material. For application where low temperature coefficient of resistivity is required; also for measuring instruments, industrial and radio rheostats and elevator controls.

- - 4 - 6 - - - -
AERISWELD—Lincoln Electric Co., Cleveland. Arc-welding electrode; for welding of bronze, brass and copper, either in manufacturing or maintenance work.

1 - 3 - - 6 - - - -
AETERNA 600 Alloy—Allied Process Corp., New York. Copper 60, zinc 38 and balance of manganese, silicon and aluminum. Furnished in finished rods or bars, tubing, and in forgings, for extruding and hot forging. Ult ts, 85-90,000 psi; nonmagnetic; weldability, good; abrasion resistance, low. For bearings, gears, cams, levers, cranks, etc.

1 - - 4 5 - - 8 - 10
AGALOY Tubing—Agaloy Tubing Co., Springfield, O.

- - - - - 5 - - - - -
SAE 1010 low- carbon tubing furnished in two types as an economical substitute for cold-drawn seamless tubing. In annealed state one has the following properties: ult ts 45-50,000 psi; yield point 30-35,000 psi; elongation, 35-42 per cent; and hardness number of 55-65 Rockwell B; while the other type, in annealed state, has an ult ts 80-85,000 psi and a hardness number of 85-90.

- - - 4 - - - 8 - 10
High-carbon alloy tubing, with mechanical properties comparable to the material in its heat-treated condition. Has high tensile strength, and is machinable. For use as a substitute for cold-drawn seamless tubing.

1 - - 4 5 - - - - -
Monel tubing. Mechanical properties in untreated state: Soft, ult ts, 70-80.000 psi; yield strength, 25-30,000 psi.; and elongation in 2 inches, 30-45 per cent. Hard, ult ts, 120,000 psi; elongation 5-10 per cent. Recommended also as a substitute for cold-drawn seamless tubing.

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AGILE—American Agile Corp., Cleveland 3.

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Silver-green electrode; carbon .8, silicon 1.4, tungsten 1.7, and boron .15. To increase impact strength, metal should be draw cooled between 400 and 650 deg F. Mechanical properties in untreated state: impact resistance, high; hardness number, 50-55 Rockwell C; sp gr, 7.85; magnetic; abrasion resistance, high. For machine parts exposed to heavy impact.

- - 3 - 5 - - - - -
Violet electrode; carbon 1.3, manganese 12-14, and nickel .8. No heat-treatment is necessary, deposited weld metal is work hardening. Mechanical properties in untreated state: ult ts, 100,000 psi; impact resistance, high; Bhn, 180-225; sp gr, 7.8; nonmagnetic; abrasion resistance, high. For surfacing of machine parts exposed to extreme wear and impact.

- - 3 - - - - - - 10
Pink electrode; carbon .22, and manganese .95. No heat treatment required. Mechanical properties in untreated state: impact resistance, medium; Bhn, 200-250; sp gr, 7.8; magnetic; abrasion resistance, medium. For hardsurfacing where subsequent machining is required.

- - 3 - - - - - - -
Dark green electrode; carbon .6, manganese .9, chromium .4. No heat treatment required. in untreated state, impact resistance is high; Bhn, over 400; sp gr, 7.8; magnetic; abrasion resistance, high. For hardfacing where impact and abrasion resistance is important. Bhn, 400 min.

- 2 3 - - - - - - -
AGILE-ACTARC—American Agile Corp., Cleveland. Electrodes for welding sheet metal, fillet welding, cast-iron welding, and hardfacing.

1 2 - - - 6 - - - -
AGRICOLA—Saginaw Bearing Co., Saginaw, Mich. Bearing bronze of copper 70, lead 30; impurities less than .2 of 1; resists corrosion caused by acids; resists heat to 500 deg F; ductility, medium. Especially adapted to diesel and airplane engine bearings.

See advertisement, Page 142

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AJAX-HAMILTON Gear Bronze—The Ajax Metal Co., Philadelphia 23. Copper 90, nickel 2, antimony 8 (nominal); furnished in rough bars or billets and ingots; ult ts 31,900 psi; yield point, 19,000; elongation, 7½ per cent; brinell hardness, 81-99; sp gr, 8.16; nonmagnetic; weldability, fair; long wearing; used for gears. Will substitute for all bronze specifications hitherto in use for gears.

1 - - 4 5 6 7 8 9 10
ALCOA—Aluminum Co. of America, Pittsburgh. Aluminum wrought and casting alloys as follows:

1 - - - - 5 - 7 - - -
2S; commercially pure aluminum sheet and plate, rod, wire, tubing, extruded shapes and rivets; ult ts, 13-24,000 psi. For sheet-metal work, chemical equipment and chemical conductors.

3S; manganese 1.2; in sheet and plate, extruded shapes; ult ts, 16-29,000 psi. For sheet-metal work and gasoline tanks for aircraft and chemical equipment.

- - - 4 - - - - 8 9 -
11S; copper 5.5, lead .5, bismuth .5; wire, rod and bar, screw machine products; ult ts, 53-57,000 psi.

14S; copper 4.4, silicon .8, manganese .8, magnesium .4; heat-treatable forgings; and extruded shapes; ult ts, 70,000 psi. For heavy-duty forgings, power shovel bails and airplane fittings.

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17S; copper 4, manganese .5, magnesium .5; furnished in rod and bar, wire, rolled and extruded shapes, rivets, forgings and screw machine products; ult ts, 62,000 psi. For structural applications in transportation fields.

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A17S; copper 2.5, magnesium .3; rivets; ult ts, 43,000 psi. For aircraft; rivets can be driven in fully heat-treated condition.

- - - 4 - - - - 8 9 -
18S; copper 4, magnesium .5, nickel 2; heat-treatable forgings; ult ts, 63,000 psi. Used for forged aircraft engine pistons where good strength at elevated temperatures is required.

1 - - 4 - - - - 8 9 -
24S; copper 4.5, manganese .6, magnesium 1.5; sheet and plate, rod and bar, wire, tubing, extruded shapes, rivets; ult ts, 73,000 psi; for structural construction in aircraft.

Alclad 24S; same as 24S composition; sheet and plate; same strength as 24S; for structural construction in aircraft.

- - - 4 - - - - 8 9 -
25S; copper 4.5, silicon .8, manganese .8; forgings for airplane propellers; ult ts, 57,000 psi.

32S; copper .9, silicon 12.5, magnesium 1, nickel .9; heat-treatable forgings for pistons, low coefficient of expansion; ult ts, 56,000 psi.

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A51S; silicon 1, magnesium .6, chromium .25; heat-treatable forgings for machine and automotive parts, especially for intricate forgings; ult ts, 47,000 psi.

1 - - - - 5 - - - 9 -
52S; magnesium 2.5, chromium .25; furnished in sheet and plate, tubing; marine and transportation applications; ult ts, 29-41,000 psi.

1-Corrosion resistant
2-Heat resistant
3-Abrasion resistant
4-High tensile strength
5-High ductility
6-Bearing application
7-Electrical uses
8-Heat treating
9-Low specific gravity
10-Machinability

1 - - - 5 - - - - 9 -
53S; silicon .7, magnesium 1.3, chromium .25; furnished in rod, wire, rolled and extruded shapes, rivets, screw machine parts and forgings; ult ts, 39,000 psi; for structures subject to severely corrosive conditions in naval and industrial applications.

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56S; magnesium 5.2, manganese .1, chromium .1; wire and rivets; ult ts, 42-58,000 psi; for joining magnesium and for cable sheathing.

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61S; copper .25, silicon .6, magnesium 1, chromium .25; ult ts, 45,000 psi; in sheet and plate, tubing, rolled and extruded shapes, wire, rod and bar; for applications in shipbuilding and transportation fields.

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75S; restricted composition; extruded shapes; ult ts, 88,000 psi; for structural applications in aircraft; high strength and aluminum alloy.

Alclad 75S; restricted composition; sheet and plate; ult ts, 77,000 psi; for structural uses in aircraft; strong aluminum alloy.

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13; silicon 12; ult ts, 37,000 psi; a general-purpose die casting alloy for large, intricate parts.

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43; silicon 5, ult ts, 19-30,000 psi; available as sand, permanent mold, and die castings; for castings that must be leakproof under pressure such as sewage disposal plant and pipe fittings.

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85; copper 4, silicon 5; ult ts, 40,000 psi; general-purpose die casting alloy for brackets, frames and levers with thick sections.

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108; copper 4, silicon 3; furnished as sand castings for manifolds, valves and other intricate castings requiring pressure tightness; ult ts, 21,000 psi.

A108; copper 4.5, silicon 5.5; furnished as permanent-mold castings for general-purpose castings of intricate design; ult ts, 28,000 psi.

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112; copper 7, zinc 1.7, iron 1.2; furnished as sand castings for crankcases, oilpans. cylinder heads, and other automotive applications; ult ts, 24,000 psi.

B113; copper 7, silicon 1.7, iron 1.2; available in permanent mold castings for machinery parts. and for general-purpose castings; ult ts, 28,000 psi.

C113; copper 7, silicon 3.5, zinc 2, iron 1.2; permanent mold castings for automotive-engine cylinder heads; ult ts, 30,000 psi.

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122; copper 10, magnesium .2, iron 1.2; sand and permanent mold castings for automotive pistons, camshaft bearings, valve tappet guides; ult ts, 27-48,000 psi.

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A132; copper .8, silicon 12, magnesium 1, nickel 2.5, iron .8; permanent mold castings for pistons; ult ts, 36-39,000 psi.

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138; copper 10, silicon 4, magnesium .2, iron 1; permanent mold castings for flat iron sole plates; retains strength and hardness at elevated temperatures; ult ts, 28,000 psi.

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142; copper 4, magnesium 1.5, nickel 2; sand and permanent mold castings for pistons and aircooled cylinder heads; ult ts, 27-47,000 psi.

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195; copper 4.5; sand castings for general structural purposes; ult ts, 32-40,000 psi.

B195; copper 4.5, silicon 2.5; permanent mold castings for general structural purposes; ult ts, 40-45,000 psi.

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212; copper 8, iron 1, silicon 1.2; sand castings for general purposes; ult ts 23,000 psi.

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214; magnesium 3.8; sand castings; ult ts, 25,-000 psi; for carburetor cases, machine parts; has high resistance to salt-water corrosion. Not recommended for acid solutions.

A214; zinc 1.8, magnesium 3.8; permanent mold castings for marine fittings and hardware; ult ts, 27,000 psi.

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218; magnesium 8; ult ts, 42,000 psi; furnished as die castings for marine fittings and hardware.

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220; magnesium 10; sand castings; ult ts, 46,000 psi; for aircraft fittings, railroad car parts, heavy-duty castings, power shovel dipper parts, marine applications; high-strength sand-casting alloy.

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A334; copper 3, silicon 4, magnesium .3; ult ts, 25,000 psi; for general-purpose sand castings; air-brake parts.

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355; copper 1.3, silicon 5, magnesium .5; permanent mold and sand castings; ult ts, 28-43,000 psi; for cylinder heads and crankcases for diesels and liquid-cooled aircraft engines.

A355; copper 1.4, silicon 5, magnesium .5, nickel .8, manganese .8; sand castings; ult ts, 25-28,000 psi; for same application as 355 but has better strength at higher temperatures.

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356; silicon 7, magnesium .3; permanent mold and sand castings; ult ts, 33-40,000 psi; for high-strength pressure-tight castings of intricate shape.

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360; silicon 9.5, magnesium .5; die castings; ult ts, 42,000 psi; general-purpose alloy for large intricate castings; a substitute for alloy 113 for castings to be made in a cold chamber machine.

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380; copper 3.5, silicon 8.5; ult ts, 45,000 psi; a high-strength general-purpose die casting alloy.

See advertisements, Pages 285, 313

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ALCUMITE—Duriron Co., Inc., Dayton, O. Copper 90, aluminum 9, iron 1. For pumps, valves, pipe, fittings, bars and castings for corrosive service where a copper base alloy is preferred.

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ALDECOR—Alloys Development Co., Pittsburgh. Steel containing molybdenum, copper, silicon and phosphorus, furnished in rough bars or billets, finished rods or bars, strips (coiled), sheets and plates for turning, boring, forging, stamping and welding. In untreated state, mechanical properties are: ult ts, 70,000 psi min; compressive, approximately the same as tensile strength; yield point, 50,000 psi min; % elongation in 8 inches, 1,500,000 ts; sp gr is same as ordinary steel; weldability, good; resists corrosion caused by atmospheric exposure, abrasion resistance, medium. Used in transportation equipment to reduce deadweight.

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ALLEGHENY LUDLUM — Allegheny Ludlum Steel Corp., Brackenridge, Pa.

"4750"; a high permeability nickel-iron alloy containing approximately 48 per cent nickel, balance iron. that must be hydrogen annealed after fabrication. Available in form of sheets, flats, squares, strip, etc.; also in the form of laminations and shields. Used in audio transformers, sensitive relays, and electrical instruments.

"88-x": a nonmagnetic high-strength alloy material. not at all stainless, which finds applications for mountings in power transformers, and on high-current bus boards in power generating stations and substations. Typical analysis—carbon .3; manganese 10, nickel 8, balance iron.

Electrical steels; furnished in coiled strip and sheets for manufacture of laminations. Used in construction of motors, transformers, relays, electromagnets, radios, etc. These steels contain ½-5 per cent silicon, depending on the application.

Relay steels; annealed silicon steel rounds, flats, squares, etc.. containing ½-2¾ per cent silicon, which find wide application for relays, electromagnets, etc.

Laminations for transformers, motors, and miscellaneous small electrical equipment and parts. Made from all grades of silicon steel and from high permeability alloys, such as Allegheny-Ludlum "4750" and Allegheny Ludlum Mumetal.

Cast resistance grids: No. 17 metal. Castings having high electrical resistance and ability to withstand continued severe mechanical shock even at high temperatures. Applications include motor starters, crane motor controls, mine locomotive controls, and power house equipment.

See advertisement, Page 157

1 - - - 4 - - - - - -
ALLEGHENY METALS — Allegheny Ludlum Steel Corp., Brackenridge, Pa.

18-8, Type 302; chromium 18, nickel 8, stainless alloy. Has basic composition for general corrosion resistance and deep-drawing operations.

18-8S, Type 304; chromium 18, nickel 8, with .08 max carbon.

18-8-C, Type 347; chromium 17-19, nickel 9-12; basic 18-8 analysis modified by addition of columbium for stabilization within the carbide precipitation range of 800-1500 deg F.

18-8-M, Type 317; carbon .1 max, chromium 16-18, nickel 10-14; basic 18-8 analysis modified by addition of molybdenum for increased corrosion resistance.

18-8-EZ, Type 303; carbon .2 max, chromium 17-19, nickel 8-10; basic 18-8 analysis modified to improve machining properties.

20-10-S, Type 308; carbon .08 max, chromium 19-21, nickel 10-12, a chromium-nickel stainless steel designed for certain applications requiring slightly higher general corrosion resistance than that of 18-8 steel.

25-12, Type 309; carbon .2 max., chromium 22-24, nickel 12-15; a chromium-nickel stainless steel for elevated temperature applications requiring ease of fabrication and a high degree of oxidation resistance and high strength and creep values up to 2000 deg F.

25-20, Type 310; carbon .25 max, chromium 24-26, nickel 19-22; a chromium-nickel steel similar to type 25-12 but exhibiting greater stability due to its higher alloy content. Coefficient of expansion is closer to that of plain steel than those of the other chromium-nickel alloys listed. Offers resistance to oxidation to 2100 deg. F.

12, Type 410; carbon .15 max, chromium 11.5-13.5; a high-strength chromium stainless steel possessing excellent resistance to corrosion and to oxidation in the range 1200-1500 deg F. A type which responds to heat treatment.,

12-EZ, Type 416; carbon, .15 max, chromium 12-14; similar to type 410 but modified to improve machining properties.

12-TB, Type 403; carbon .15 max, chromium 11.5-13; a high-strength chromium steel widely used to meet requirements of turbine construction which calls for high elastic limit and impact values.

12-2, Type 414; carbon .15 max, chromium 11.5-13.5, nickel 1.25-2.5 max; a high-strength chromium steel with small nickel content possessing properties of basic Allegheny Metal 12 steel, but with more definite response to heat treatment.

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17, Type 430; carbon .12 max, chromium 14-18; a low-carbon, high-chromium structural stainless steel possessing high degree of resistance to chemical and atmospheric corrosion and oxidation up to 1600 deg F, together with high strength and ease of fabrication.

17-EZ, Type 430F; carbon .12 max, chromium 14-18; similar to Allegheny Metal 17 but modified to improve machining properties.

21, Type 442; carbon .35 max, chromium 18-23; a straight chromium steel designed primarily for high temperature service in applications not involving difficult fabrication.

28, Type 446; carbon .35 max; chromium 23-30; a straight chromium steel which offers excellent resistance to chemical corrosion and to oxidation up to 2150 deg. F.

H-17, Type 440C; carbon .95-1.2, chromium 16-18; a 17 per cent chromium alloy steel with high carbon which through heat treatment develops maximum hardness and wear resistance, together with high strength and corrosion resistance.

M-17, Type 440A; carbon over .12, chromium 16-18; an alloy similar to H-17 but with lower carbon, possessing increased resistance to corrosion and higher impact values with somewhat lower hardenability.

L-12, Type 420; carbon over .15, chromium 12-14; a stainless steel which, due to its higher carbon content, can be heat treated to greater hardness than Allegheny Metal 12 and 12-2 with but slight impairment of the corrosion-resistant qualities.

46, Types 501 and 502; carbon for 501 over .1 and for 502, .1 max; chromium for both types 4-6; a low-chromium structural steel possessing strength and corrosion and oxida-

tion-resistance intermediate to those of plain carbon steel and the regular stainless steels. Available with molybdenum for increasing tensile and creep strengths at high temperatures.

See advertisement, Page 157

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ALNICO — General Electric Co., Schenectady, N. Y. Permanent magnet alloy of high coercive force. Iron, nickel and aluminum as basic ingredients. Extremely hard, generally must be ground. Available in both sintered and cast form. Sintered Alnico furnished by General Electric and cast Alnico by the following: Arnold Engineering Co., Chicago; Belden Mfg. Co., Chicago; Cinaudagraph Corp., Stamford, Conn.; Crucible Steel Co. of America, New York; General Magnetic Corp., Chicago; Indiana Steel Products Co., Chicago; Simonds Saw & Steel Co., Lockport, N. Y.; Taylor-Wharton Iron & Steel Co., High Bridge, N. J.; and Thomas and Skinner Steel Products Co., Indianapolis.

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ALUMINWELD—Lincoln Electric Co., Cleveland. A 5 per cent silicon-aluminum-alloy electrode for arc-welding aluminum in any form —cast, sheet, shapes, or extruded forms. For either metallic or carbon arc welding. Welds are very dense without porosity and possess high tensile strength.

1 2 - 4 - - - - - - -
AMBRAC — American Brass Co., Waterbury, Conn. Alloy 850; copper 75, zinc 5, nickel 20; high ductility. Used for condenser tubes, etc.

See advertisements, Pages 279-282

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AMERCUT—American Steel & Wire Co., Cleveland. Cold finished carbon and alloy steel bars either cold drawn, annealed, normalized, spheroidized or quenched and tempered to meet various combinations of definite physical, magnetic, corrosion-resistant or machinability property specifications. For screw machine use or shafting.

See advertisement, Page 169

1 2 - - - - 7 - - -
AMERICAN—American Nickeloid Co., Peru, Ill. Bonded metals; chromium, nickel, brass, copper, gold resemblance and colors bonded to base metals such as steel, tin-plate, zinc, brass, copper, aluminum and nickel silver. Available in brilliant finishes and patterns as sheets, flat strips, coiled strip and round edge flat wire. Can be supplied with gum-adhered paper covering protecting prefinish in drawing and preforming.

Copper steel; copper plated to steel, latter serving as rust resistant, inexpensive metal, conserving quantities of critical solid copper. Available in polished and unpolished finishes in sheets, flat strips and coiled strip for continuous feed automatic presses.

Zinc-plated steel; a rust-resistant and corrosion-resistant metal used as a practical alternate for nickel, tin, aluminum, brass and copper. Available in polished and unpolished finishes in sheets and flat strips, in a wide range of gages.

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AMERICAN QUALITY—American Steel & Wire Co., Cleveland. Carbon steels and alloys in the form of cold-rolled strip, manufacturer's wire and springs.

See advertisement, Page 169

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AMOLA—Chrysler Corp., Detroit. Also made by various steel companies as licensees under patent controlled by Chrysler Corp. Machinery and constructional steels furnished in 20 grades which vary in analyses only in regard to carbon content. Basically the analysis is manganese .7-.9, phosphorus (max) .04, sulphur (max) .04, silicon .2-.3, and molybdenum .15-.25. Used for carburized gears, axle shafts, and springs, with as little thickness as 5/1000 of an inch.

MS 244 electric furnace, carbon .66-.7.
MS 245 open hearth; entire formula same as MS 244.
MS 246 electric furnace; carbon .6-.65.
MS 247 open hearth; carbon same as MS 246.
MS 248 electric furnace; carbon .55-.6.
MS 249 open hearth; carbon same as MS 248.
MS 260 electric furnace; carbon .5-.55.
MS 261 open hearth; carbon same as MS 260.
MS 262 electric furnace; carbon .45-.5.
MS 263 open hearth; carbon same as MS 262.
MS 266 electric furnace; carbon .4-.45.
MS 267 open hearth; carbon same as MS 266.
MS 268 electric furnace; carbon .35-.4.
MS 269 open hearth; carbon same as MS 268.
MS 270 electric furnace; carbon .3-.35.
MS 271 open hearth; carbon same as MS 270.
MS 276 electric furnace; carbon .25-.3.
MS 277 open hearth; carbon same as MS 276.
MS 290 electric furnace; carbon .20-.25.
MS 291 open hearth; carbon same as MS 290.

1 - 3 4 5 6 - - - -
AMPCO METAL—Ampco Metal Inc., Milwaukee 4. Special copper-base alloys produced in several grades. Data which follows gives chemical compositions and physical properties.

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Grade 12; copper, balance, aluminum 8.5-9.3, iron 2.50-3.25, others .50 max; furnished as sand or centrifugal castings; rods or bars. Corrosion-resistant. Good physical properties to 1000 deg F; ts, 70,000 psi; yield strength, 28,000 psi; compressive, 120,000 psi; sp gr, 7.73; Bhn, 3000 Kg.-115; elongation, 25 per cent min; abrasion-resistant; nonmagnetic. Used as bushings. Good machinability, can be forged and welded.

1 - - 4 - 6 - - - -
Grade 15; copper, balance, aluminum 9-10, iron 2.75-4.0, others .50 max; furnished as solid or hollow rods and bars or sheet. Corrosion-resistant. Good physical properties to 1000 deg F; ts, 85,000 psi; yield strength, 40,000 psi; sp gr, 7.62; Bhn, 3000 Kg-160; elongation, 25 per cent; abrasion-resistant; nonmagnetic; has good surface finish; good bearing qualities. Used for bushings, bearings, small worm wheels, bolts, nuts or studs.

1 - - 4 5 - - - - -
Grade 16; copper, balance, aluminum 9.80-10-30, iron 3-4, others .50 max; furnished as sand or centrifugal castings. Corrosion-resistant. Good physical properties to 1000 deg F; ts, 85,000 psi; yield strength, 32,000 psi; compressive, 125,000 psi; sp gr, 7.62; Bhn, 3000 Kg-140; elongation, 20 per cent; abrasion-resistant; nonmagnetic. Used for bushings, bearings, gear slides and shifter forks. Good machinability; can be forged and welded.

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Grade 18; copper, balance, aluminum 10.30-11.0, iron 3.0-4.25, others .5 max; furnished as sand or centrifugal castings; also as rods or bars. Corrosion-resistant. Good physical properties to 1000 deg F; ts, 85,000 psi; yield strength, 35,000 psi; compresive, 136,000 psi; sp gr, 7.58; Bhn, 3000 Kg-170; elongation, 16 per cent; abrasion-resistant; nonmagnetic. Used as heavy-duty bushings, bearings, gears, worm wheels, feed nuts and pickling equipment. Fair machinability.

Grade 18-23; heat-treated version of Grade 18 above. Furnished as sand or centrifugal castings, rods or bars. Corrosion resistant. Good physical properties to 750 deg F; ts, 100,000 psi; yield strength, 45,000 psi; compressive, 15,000 psi; sp gr, 7.60; Bhn, 3000 Kg-190; elongation, 14 per cent; abrasion-resistant; nonmagnetic. Used where high strength, good bearing properties and wear resistance is required. Ideal for heavy-duty worm gears. Can be forged and welded.

Grade 20; copper, balance, aluminum 11.40-12.20, iron 3.25-4.50, others .5 max; furnished as sand or centrifugal castings, rods or bars. Corrosion-resistant. Good physical properties to 1000 deg F; ts, 85,000 psi; yield strength, 38,000 psi; compressive, 146,000 psi; sp gr, 7.43; Bhn, 3000 Kg-230; high abrasion resistance; nonmagnetic. Used as cams, cam rollers, welding jaws, bushings and bearings (wherever high resistance is required). Can be forged and welded.

Grade 21; copper, balance, aluminum 12.60-13.40, iron 3.5-5.0; others .50 max; furnished as sand or centrifugal castings, rods or bars. Corrosion-resistant. Good physical properties to 1000 deg F; ts, 75,000 psi; yield strength, 45,000 psi; compressive, 160,000 psi; sp gr, 7.14; Bhn, 3000 Kg-300; high abrasion resistance; nonmagnetic. Used in drawing and forming dies, bushings and liners, replacing steel. Can be forged and welded.

Grade 22; copper, balance, aluminum 13.7-14.4, iron 4.0-5.25, others .50 max; furnished as sand or centrifugal castings, rods or bars. Corrosion-resistant. Good physical properties to 1000 deg F; ts, 80,000 psi; yield strength, 60,000 psi; compressive, 171,000 psi; sp gr, 7.21; Bhn, 3000 Kg-330; high abrasion resistance; nonmagnetic. Used as cam rollers, wear strips, forming and drawing dies. Can be forged and welded.

See advertisement, Page 303

1 - 3 4 5 6 - - - -
AMPCOLOY—Ampco Metal Inc., Milwaukee 4. Various grades of copper-base alloys.

1 - 3 - 5 - - - - -
Grade A-3; copper 89, aluminum 10, iron 1; furnished as sand or centrifugal castings, rods or bars. Corrosion-resistant. Good properties to 1000 deg F; ts, 70,000 psi; yield strength, 26,000 psi; Bhn, 3000 Kg-115; fair abrasion resistance; high ductility; nonmagnetic; good bearing properties. Used for bushings, bearings, and pickling equipment. Can be forged and welded.

1 - - 4 - 6 - - - -
Grade A-323; heat-treated to A-3 analysis above. Furnished as sand or centrifugal castings, rods and bars. Corrosion-resistant. Good physical properties to 750 deg F; ts, 80,000 psi; yield strength, 40,000 psi; Bhn, 3000 Kg-145; high ductility; good abrasion resistance; nonmagnetic; excellent bearing properties. Used for bushings, bearings, gears and sleeves; also screw down nuts, can be forged and welded.

Grade E-1; analysis similar to A-3 above; furnished as sand or centrifugal castings. Corrosion-resistant. Good physical properties to 1000 deg F; ts, 75,000 psi; yield strength, 30,000 psi; Bhn 3000 Kg-140; fair abrasion resistance; fair ductility; nonmagnetic; good bearing properties. Used for bearings, bushings, gears and pickling equipment.

Grade E-117; analysis similar to A-3 above. Heat-treated. Furnished as sand or centrifugal castings. Corrosion-resistant. Good physical properties to 750 deg F; ts, 90,000 psi; yield strength, 60,000 psi; Bhn, 3000 Kg-225; good abrasion resistance; nonmagnetic. Finds use in special applications. Can be welded or forged.

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Grade 46-22; copper, balance, aluminum 10-11, iron 4-6, nickel 4-6; furnished as sand castings, rods or bars. As heat-treated: Ts, 110,000 psi; yield strength, 60,000 psi; elongation 10%; reduction of area, 8%; Bhn, 3000 Kg - 217-348. For use where strength with ductility is required. Can be forged and welded.

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62, 64 and 66; a series of low, medium and high strength manganese bronzes. Furnished as sand or centrifugal castings. Ts, from 65-110,000 psi; yield strength, 30-65,000 psi; Bhn, 3000 Kg - 115-215. Finds many uses for structural parts not requiring best bearing characteristics. Can be readily forged and all three grades are weldable.

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86; beryllium-copper; copper 96.3; beryllium 2.5; nickel 1.2; furnished as sand or centrifugal castings; heat-treated; ts, 100,000 psi; yield strength, 90,000 psi; Bhn, 3000 Kg - 400. Used for welding dies and safety tools.

91 and 97; high conductivity copper chromium and copper cobalt, beryllium alloys; supplied as sand or centrifugal castings; before final heat treatment can be forged; high electrical thermal conductivity. Used as welding wheels, electrodes, collector rings, collector shoes, current-carrying parts of electrical and other machinery.

See advertisement, Page 303

1 - 3 4 - - - - - -
AMPCO-TRODE—Ampco Metal Inc., Milwaukee 4. Coated weldrod in various aluminum bronze alloys listed under Ampco Metal. Used for weldrod overlays on steel, cast iron, brass or bronze repairing with high strength bronze rod of practically all metals.

See advertisement, Page 303

1 2 3 4 5 - - 8 - -
AMSCO—American Manganese Steel Div., American Brake Shoe Co., Chicago Heights, Ill.

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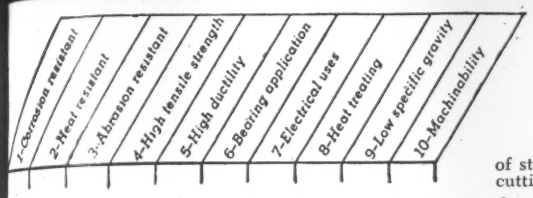
Manganese steel; 10-14 manganese, 1-1.40 carbon, balance iron. Suitable for sand casting; for power shovel dippers and teeth, rock crusher parts, dredge pumps, etc.

1 2 - 4 - - - - - -
Alloy F-1; 15-18 chromium, 34-37 nickel; for molten metal containers, liquid containers, and furnace parts for heat treating, especially under frequent and drastic temperature changes; heat-resistant to 2100 deg F; creep resistant at high temperatures.

F-3; 26-29 chromium, 3 max nickel; for rabble arms and blades, sintering bars, etc.; heat-



resistant to 1800 deg F where temperature changes are not wide and high unit strength is not essential, and where high sulphur fuels are used.

F-5; 17-20 chromium, 64-70 nickel; furnace conveyor pans, heat-treating boxes, enameling fixtures, etc; similar properties to F-1 and F-6, except tougher and more resistant to temperature fluctuations.

F-6; 12-15 chromium, 58-64 nickel; for heat-treating boxes, retorts, etc; where temperature changes or uneven heating are severe.

F-8; 18-21 chromium, 9-12 nickel; for mine water and acid pump parts, marine fittings, chemical mixer and paper mill parts. Heat-resistant to 1550 deg F.

F-10; 26-28 chromium, 10-13 nickel; for heat-treating furnace shafts, dampers and valves, cement kiln and cooler parts etc; creep-resistant at high temperatures; where temperature changes are not severe; and where high sulphur fuels are used.

F-12; 27-30 chromium, 7-10 nickel; same as F-10 except when sulphur is very high. Also for resistance to corrosion by some acids. Superior to F-8 in some paper mill applications.

F-13; 25-28 chromium, 34-37 nickel; for temperatures up to 2100 deg F. Used in place of F-1, F-5 and F-6 where sulphur is present in gaseous form.

F-14; 24-27 chromium, 19-22 nickel; for high temperatures under carburizing conditions with some sulphur present.

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Nickel-manganese steel; 13-15 manganese, .70-.90 carbon, .95-1.20 silicon, 3.50-4.50 nickel; welding-rod for building up and strength welding of austenitic manganese steel castings.

Farmface; chromium, manganese, silicon, hard alloy welding-rod for hard-surfacing agricultural machinery and other parts.

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No. 459; chromium molybdenum hard alloy welding-rod for hard-surfacing machinery wearing parts; deposits are 500-600 brinell.

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No. 217; chromium-molybdenum-tungsten welding-rod for hard-facing cast wearing parts; extreme hardness and great wear resistance.

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Dieweld; a chromium-molybdenum welding-rod for building up forming dies, cutting tools, punches, shear knives, etc.

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Economy hardface; self-hardening, chromium-molybdenum-high carbon welding-rod manufactured coated for alternating or direct-current electric welding and bare for oxy-acetylene deposition; used for applications where extreme impact and abrasions are encountered.

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Toolface; high-carbon, high-chrome, molybdenum, tungsten and vanadium bearing welding rod commonly known as high-speed steel. For cutting tools, also forging dies, rock drill bits. Also used as hard-surfacing rod where extreme hardness and resistance to shock is required. Brinell hardness is 575-675.

1 2 3 4 5 6 7 8 - 10

ANACONDA—American Brass Co., Waterbury, Conn. Many copper base alloys, as well as pure copper in various forms under this trade-name are available, some of which are listed below.

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Beryllium Copper; copper 97.50, beryllium 2.15, nickel .35; abrasion-resistant; high tensile strength and ductility. For springs, diaphragms, low-duty bushings and bearings.

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"85" Red Brass; copper 85, zinc 15; pipe tube and sheet forms; particularly resistant to salt water corrosion.

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Super-Nickel; copper 70, nickel 30; seamless tubes, sheets and plates. For severe condenser tube service and where resistance to salt water corrosion is desired.

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Special Phosphor Bronze; copper 88, tin 4, zinc 4, lead 4; corrosion, heat and abrasion-resistant; combines general characteristics of standard phosphor bronze alloys with free-cutting qualities of yellow brass.

See advertisements, Pages 279-282

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ANCHOR Carbon - Vanadium — Anchor Drawn Steel Co., Latrobe, Pa. Drill rods for use where toughness is required, and where minimum machining is necessary. Hardens with fine-grained tough case, and resists breakage. For pins, bushings, etc.

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ANFRILOY—Wellman Bronze & Aluminum Co., Cleveland. A copper-lead-tin bearing bronze for high speed, light-duty bearings and for bushings where pressure and thrust are not excessive.

See advertisement, Page 164

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ANTIMONIAL ADMIRALTY — Chase Brass & Copper Co., Waterbury 91, Conn. Copper 71, tin 1, antimony .05, zinc 27.95. Outstanding for general corrosion resistance and particularly for preventing dezincification. Recommended for condensers in the power plant and oil industries.

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APEX—Apex Smelting Co., Chicago 12. Aluminum, zinc and magnesium base die casting alloys in slab, ingot, shot, and piglet form.

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APOLLO—Apollo Metal Works, Chicago 38.

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Chromsteel: cold-rolled strip, nickel-chrome-plated steel, furnished in sheets and strips, for stamping into parts. Resists heat to 800 deg F; abrasion resistance, medium; weldability, fair. Used generally as substitute for brass and copper sheet and other critical metals when resistance to corrosion is essential or reflectivity is needed.

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Zinc steel; corrosion-resistant sheet or strip, zinc-plated to engineering specifications; for stamping and welding. Resists corrosion caused by salt water. Has high tensile strength, and is used for bearing applications.

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APOLLOY METAL—Apollo Steel Co., Apollo, Pa. Carbon .06-.10, manganese .30-.60, sulphur .045 max, phosphorus .04 max, copper .20 per cent min; in sheets; for stamping and welding into parts; ult ts, 45-50,000 psi; yield point 25-30,000 psi; abrasion resistance, low; hardness B 40 to 50 Rockwell.

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ARISTOLOY—Copperweld Steel Co., Warren, Ohio. Full range of S.A.E. alloy steels, also aircraft, and special steels. Used for gears, both light and heavy-duty, clutches, shafts and pinions; also in ball and roller bearings and aircraft parts, both for engine and plane use; stainless and nitralloy steels. Also available are aircraft steels, stainless, nitralloy, bearing steels, and carbon and alloy tool steels. In its Glassport, Pa., plant the company produces copper-covered steel wire, strand and rods.

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ARMASTEEL—Saginaw Malleable Iron Division, Saginaw, Mich. Carbon 2.60, silicon 1.40, manganese .4, sulphur less than .15, phosphorus, less than .1; fabricated into parts by sand casting. Recommended heat treatment to suit customers' requirements; ts, ult, to 100,000 psi; yield point to 85,000 psi; elongation, to 8.0 per cent; Bhn, 163-302; Rockwell "C" to 55 on hardening; sp gr, 7.2. For camshafts, rocker arms, diesel pistons, refrigerator parts, crankshafts, connecting rods, etc, also other automotive, diesel and hydramatic transmission parts.

1 2 3 4 5 - 7 - - -

ARMCO—American Rolling Mill Co., Middletown, O.

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Stainless steel grade 18-8 (type 302, 304); 17-7 (type 301); 18-12 Mo. (type 316); 25-12 (type 309); 17 (type 430); 13 (type 410); 18-10 Cb (type 347); 18-10 Ti (type 321); and 27 (type 446); these can all be drawn and stamped; all machinable, abrasion-resistant and weldable.

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Armco High Strength 50y and 55y; a low alloy, high-strength. Supplied in sheets, strip and plates. Suitable for stamping, welding.

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Tran-Cor 58; high silicon steel for distribution transformers. Grade 65; steel sheets with low core loss for power and distribution transformers. Grade 72; a high silicon steel for large generators and transformers.

Intermediate Transformer; scale-free silicon steel sheet for some transformer and special applications.

Special Electric; scale-free medium steel sheet for ac motors and generators.

Electric; special analysis sheet for rotating machines.

Armature; steel sheet for small dc motors.

Field Grade; special sheet for intermittent duty fractional horsepower motors.

Radio No. 6; for applications in which superior low induction magnetic characteristics are important. No. 5; for audio transformer cores and other low induction applications. No. 4; good permeability at low induction; for chokes. Nos. 3, 2 and 1; for small transformers.

Ingot Iron; highly refined iron for magnetic cores; supplied in round and flat bar form.

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Armco Ingot Iron; highly refined iron supplied in galvanized sheet for general sheet metal work; also hot rolled annealed and cold rolled sheets, plates and strip.

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Armco Enameling Iron; highly refined iron for porcelain enameling uses; supplied in sheets.

Armco wrought steel wheels; one-wear, two-wear, multiple wear, heat-treated and stress resistant. Long mileage and safety factors; meet all A.A.R. or special specifications. Available from 18- to 48-inch diameters.

Aluminized; a special aluminum-coated sheet (strip or coil) with exceptional resistance to heat and corrosion.

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ASARCOLOY No. 7—American Smelting & Refining Co., New York. A cadmium-nickel bearing alloy capable of withstanding high compression loads and high operating temperatures. Nickel 1.3, balance cadmium. Furnished in ingots for spinning and permanent mold castings. Resists heat to 300 deg F; high abrasion resistance; ts, ult, 15,000 psi; compressive, 20,000; sp gr, 8.7; bearing properties, good; weldability, good; Bhn, untreated 33. Used for bearings.

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ATLAS No. 93—Allegheny Ludlum Steel Corp., Brackenridge, Pa. Carbon .55, chromium .65, molybdenum .35; for collets, studs and parts requiring toughness in hardened condition. Oil hardening. For use as bucket teeth, keys, pins, bolts, studs, etc.

See advertisement, Page 157

1 - - 4 - 6 - - - -

AUROMET—Aurora Metal Co., Aurora, Ill., special aluminum, bronzes, aluminum-nickel bronzes, and silicon bronzes of several compositions. Mechanical properties in untreated state; ult ts, 75-110,000 psi; yield point, 25-50,000 psi; elongation, 10-40 per cent; impact resistance, 30 ft-lb; hardness number, 65-100 Rockwell B; sp gr, 7.4; nonmagnetic; weldability, good; resists corrosion caused by weak acids and salt solutions; and heat to 750 deg F; abrasion resistance, medium. For use as impellers, pump parts, bushings, worm gears, highly stressed structural parts, and vibration dampening components.

1 2 3 - - - - - - -

AVIALITE—American Brass Co., Waterbury, Conn. Copper-aluminum alloy for valve seats and guides in airplane motors.

See advertisements, Pages 279-282

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"AW" (rolled steel floor plate)—Alan Wood Steel Co., Conshohocken, Pa. Furnished in five patterns to meet flooring problems in the industrial and transportation fields; designed to withstand heaviest traffic; oil-proof, crackproof, heatproof, slipproof, and noiseless. Furnished in carbon, copper or alloy analysis; also available in other non-ferrous metals.

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"AW" DYN-EL—Alan Wood Steel Co., Conshohocken, Pa. Furnished in sheets, strips, and plates for stamping, welding, cold forming and hot forming, etc; abrasion resistance, medium; ts, 70-80,000 psi; ductility, high; weldability, good; fatigue and impact values, high. For structures requiring high strength.

B

1 2 - - - - - - - - -
B & W CROLOY—Babcock & Wilcox Tube Co., Beaver Falls, Pa.

1¼; carbon .15 max, chromium 1-1.5, molybdenum .45-.65, silicon .5-1; useful to 1000 deg. F in steam, slightly higher in oil refining; has fair creep-strength where limited corrosion and oxidation resistance are required.

2; carbon .15 max, chromium 1.75-2.25, molybdenum .45-.65, silicon .5 max; for refinery and superheater tubes. Corrosion and heat-resistant at nominal temperatures.

2¼; carbon .15 max, chromium 2-2.5, molybdenum .9-1.1, silicon .5 max; for refinery and superheater tubes where exceptionally high creep strength is required.

3M; carbon .15 max, chromium 2.75-3.25, molybdenum .8-1, silicon .5 max; suitable from 1000 to 1050 deg F in steam or to 1175 deg F in refinery application; good creep properties and corrosion resistance superior to Croloy 2 or 2¼.

5; chromium molybdenum; carbon .15 max, chromium 4-6, molybdenum .45-.65; for oil refinery service.

7; carbon .15 max, chromium 6-8, molybdenum .45-.65; for oil refinery service where increased corrosion resistance is required.

9; carbon .15 max, chromium 8-10 molybdenum .80-1.30 min; semistainless alloy of good physical properties and corrosion resistance.

12 (Type 410); carbon .15 max, chromium 12-14; resistant to atmosphere and acids; resists heat to 1500 deg F and when heat treated has tensile strength of 180,000 psi.

18 (Type 430); carbon .12 max, chromium 15-18; useful for certain elevated temperature applications but particularly for nitric acid plant equipment.

18-8S (Type 304); carbon .08 max, chromium 18-20; nickel 8-11; low carbon; for high temperature work or corrosion-resistant service.

18-8S-Cb; carbon .08 max, chromium 18-20, nickel 8-11; low carbon; columbium stabilized 18-8S for welding or heating in carbide range; otherwise similar in properties to Croloy 18-8S.

18-8S-Ti; carbon .08 max, chromium 18-20, nickel 8-11; low carbon; titanium stabilized 18-8S; adaptable for welding without danger of sensitization toward intercrystalline corrosion; more stable on long heating at high temperatures.

16-13-3 (Type 316); carbon .08 max, manganese 2 max, chromium 16-18, nickel 11-14; molybdenum 2-3; austenitic type alloy similar in many respects to 18-8S and 25-20; high strength at elevated temperatures; corrosion-resistant.

18-13-3 (Type 317); carbon .08 max, chromium 18-20, nickel 11-14, molybdenum 3-4; austenitic type alloy with maximum corrosion resistance for many chemical environments.

25-20 (Type 310); chromium 25, nickel 20; high strength and high oxidation resistance; also excellent corrosion resistance.

27 (Type 446); carbon .2 max, chromium 26-30, resistant to oxidation to 2100 deg F; also corrosion-resistant.

See advertisements, Pages 298, 299

1 2 - - - - 7 - - -
BAKER—Baker & Co. Inc., Newark 5, N. J. Platinum and alloys for linings, contacts, thermocouples, furnace resistors, etc.

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BEARITE—A. W. Cadman Mfg. Co., Pittsburgh. Babbitt metal furnished in ingots and 50-lb pigs; Bhn at 70 deg F, 29.1; 212 deg F, 24.4; compressive strength, 15,000 psi. For rotary bearings subjected to heavy loads and extreme speed.

1 - - - 5 6 - - - -
BEARIUM METALS — Bearium Metals Corp., Rochester, N. Y. High-lead bronze with specially prepared metallurgical structure providing good frictional properties.

Grade B-4; copper 70, tin 4, lead 26. Furnished in rough cored or solid bars, as sand castings, machined bushings, and in long lengths for screw-machine use. Ts, 21,000 psi; compressive, 9750 psi; Bhn, 40. Abrasion resistance, high; low coefficient of friction; high ductility. Resists corrosion caused by acids. Used for bushings, bearings, packing and piston rings, and seals.

Grade B-10; copper 70, tin 10, lead 20. Furnished in rough cored or solid bars, rough castings, machined bushings, screw-machine rod stock. Ts, 25,500 psi; compressive, 11,800 psi; Bhn, 55. Abrasion resistance, high; low coefficient of friction; high ductility. Resists corrosion caused by acids. Good bearing properties. Used for bearings, bushings, packing and piston rings, seals, crosshead shoes.

See advertisement, Page 310

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BECKETT METAL—Beckett Bronze Co., Muncie, Ind. Several grades of high lead bronze; copper 60-75, tin 3-9, lead 16-35, and nickel 0-1; furnished in rough bars and rods (cored or solid) for turning, boring, etc. Resists corrosion due to sulphuric-hydrochloric acid solutions. Resists heat to 400 deg F; ts, 21-24,000 psi; good bearing properties; Bhn, untreated, 36-46. Used for bearings, bushings, and to a limited extent in seals, piston rings and gears.

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BELECTRIC—Belle City Malleable Iron Co., Racine, Wis. Furnished as sand castings; ts, 35-60,000 psi; high compressive strength; good bearing properties; recommended heat treatments are the same as for standard gray iron; Bhn, untreated, 179-285; heat treated, 300-550. Used where rigidity, wearability or where strong high grade gray iron might be applied.

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BELECTROMAL—Belle City Malleable Iron Co., Racine, Wis. High strength malleable iron furnished as sand castings; ts, 60-70,000 psi; high ductility; Bhn, untreated, 140-170. Recommended for castings for automotive, railroad, tractor and implement work.

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BELMALLOY—Belle City Malleable Iron Co., Racine, Wis. Pearlitic malleable iron, electric furnace melted and continuous oven, annealed; ts, 70,000 psi min; yield point, 45,000 min; elongation, 5 per cent min; and Bhn, 179-217. Used for castings of machining quality requiring strength and shock resistance.

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BENDIX Metal Hose—Metal Hose Div., Bendix Aviation Corp., Philadelphia 44. Corrugated seamless tubing with an analysis of various alloys. Used for exhausts, oil lines, vibration eliminators, etc.

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BERALOY "A"—Wilbur B. Driver Co., Newark, N. J. Beryllium-copper alloy; copper 97.75, beryllium 2, and cobalt .25; furnished in soft annealed state or in slightly cold-worked conditions for easy machining and forming into parts. Ts, 66,000 psi in annealed state, can be increased to 175,000 psi by simple hardening treatment at 600 deg. F, and by cold work after solution anneal, tensile strength can be increased to 200,000 psi. Used for electrical spring parts, contacts, switch jaws, diaphragms, switch parts, bearings, connectors, valves, cams, etc.

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BERMAX BABBITT—Federal Mogul Corp., Detroit. A high lead babbitt; easy to use, cast and easy to handle in rebabbitting; melting point slightly higher than that of tin-base metals and can be cast by any method without fear of segregation. For use as bearing lining.

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BERYLCO No. 25—Beryllium Corp. of Pa., Reading, Pa. Beryllium 1.9-2.1, cobalt .15-.25, balance copper; furnished as rough bars or billets, finished rods or bars, strips, tubing, and wire; for sand casting, die casting, turning, boring, forging, stamping and welding. Recommended heat treatment, 600-650 deg F for 2-3 hours depending on temper. Mechanical properties in heat-treated state; ult ts, 175-200,000 psi; yield point, 146-179,000 psi; elongation, 2-10 per cent; impact resistance, high; sp gr, 8.23 + or — .02; nonmagnetic; weldability, fair. Resists corrosion caused by salt water and alkalies. Heat resistant to 350 deg F; abrasion resistance, high. Used for bushings, cams, gears, valve bodies, etc.

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BETH-CU-LOY—Bethlehem Steel Co., Bethlehem, Pa. A copper-bearing-steel resistant to atmospheric corrosion. For jackets, covers, machine guards, oil pans, etc.

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BETHLEHEM—Bethlehem Steel Co., Bethlehem, Pa.

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No. 235; abrasion-resistant, high-carbon-manganese-silicon steel of 235 brinell. For shovels, crushers, hoppers, scraper blades and conveyors.

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No. 88-80; chromium-molybdenum steel castings with high abrasion resistance. For ball mill liners, rolls, tires, bottom plates, etc.

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Bearing steels; standard high-carbon, high-chromium (52100 type) for ball bearings; and low-carbon nickel-molybdenum type for roller bearings. All grades can be processed to meet the requirements of automotive and industrial service.

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Magnet steels; high-carbon steels with varying chromium content, up to 6 per cent.

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BINNEY METAL—The Binney Castings Co., Toledo 7, O. Also known as Min-Ox. See listing under Min-Ox.

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BINNEY No. 71 and No. 73—The Binney Castings Co., Toledo 7, O. Heat-resisting alloy castings; weldability, good; heat-resistant to 2000 deg F; abrasion resistance, high. Used for construction parts for heat-treating furnaces and all applications requiring heat-resistant castings.

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BISCO—Bissett Steel Co., Cleveland 8. Steel tubing, nondistorting, oil-hardenable, chrome-manganese type. Can be hardened within a wide range of temperatures without distorting—range about 1500-1600 deg F. Hardness, (as quenched), 64-66 Rockwell C; magnetic; weldability, good; abrasion resistance, high. For sleeves, bushings, collets, reciprocating parts, bearings, spacer collars, rim rolls, crushing rolls, and other tubular parts where extreme hardness and wearability are required.

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BISCO-CUMBERLAND — Bissett Steel Co., Cleveland 8. Ground shafting, in finished rods or bars, for sawing. Ult ts, 100,000 psi min; yield point, 55,000 psi min; Bhn, 183-230; magnetic; weldability, good. Primary properties: finish, concentricity, straightness, and dimensional accuracy. For any shaft requiring close tolerance and fine finish.

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BOHNALITE—Bohn Aluminum & Brass Corp., Detroit. Light alloy of which aluminum is the base. For forged connecting rods, cast cylinder heads, crankcases, transmission cases, and parts for vacuum cleaners, washing machines, shoe machinery, etc.

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BOROD—Stoody Co., Whittier, Calif. A rod made up of various screen sizes of irregularly shaped particles of tungsten carbide material—40-125 screen size—contained in steel tubes. Offers maximum resistance to abrasion; hardness 9-10 on Moh's scale; provides maximum wear resistance on earth drilling and scraping equipment; also excellent for hard-facing small or tin parts such as coal cutter bits and cane knives.

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BOUND BROOK—Bound Brook Oil-Less Bearing Co., Bound Brook, N. J. Bushings, bearings and washers; cast bronze inlaid with hard graphite lubricant in grooves or holes of various designs; particularly adaptable to high temperatures, severe static loads, immersion in liquids, exposure to dusts or where oils are objectionable.

See advertisement, Page 302

1 - - - 5 - - - - -
BRASSOID—American Nickeloid Co., Peru, Ill. Brass bonded to zinc, latter serving as rustproof, flexible and inexpensive white metal base. Available in variety of brilliant finishes and patterns, as sheets, flat strips and coiled strip for continuous feed automatic presses. Can be supplied with quick removable, gum-adhered paper covering, permitting drawing and forming without marring prefinish.

1-Corrosion resistant | 2-Heat resistant | 3-Abrasion resistant | 4-High tensile strength | 5-High ductility | 6-Bearing application | 7-Electrical uses | 8-Heat treating | 9-Low specific gravity | 10-Machinability

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BRIDGEPORT COPPER AND ZINC ALLOYS—Bridgeport Brass Co., Bridgeport, Conn.

Yellow brass; copper 65, zinc 35; copper 70, zinc 30; sheet, wire and seamless tubing for drawing, stamping, and cold heading.

Cartridge brass; copper 70, zinc 30. Sheet for making small arms ammunition and artillery cartridge cases.

Free-cutting brass rod; copper 60, lead 3, balance zinc. For making automatic screw machine parts.

Forging rod; copper 60, lead 2, balance zinc

Low brass; copper 80, zinc 20; pale golden color. For parts requiring greater ductility and malleability than possessed by yellow brass.

Commercial bronze; copper 90, zinc 10; bronze color for manufacturing stampings and drawn items and cold headed items, for outdoor use. Stands weathering better than yellow brass; copper sheet, rod, wire, seamless tubing for miscellaneous manufacturing.

Leaded brass alloys; contain from .25-3.75 per cent lead to facilitate machining.

Phosphor-bronze; copper 92, tin 8; for spring parts. Has better spring properties than lower tin content.

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Phosphor-bronze; copper 95, tin 5; sheet spring quality for manufacturing switch parts.

Copper in form of sheet and tube for fabricating.

Bronze welding rods in a variety of alloys for brazing iron and steel gears, frames, and other broken machine parts; for welding silicon bronze tanks.

1 2 - - 5 - - - - - -
BRIDGEPORT TUBING—Bridgeport Brass Co., Bridgeport, Conn.

Condenser tubing; available in Admiralty metal for sea water, Cuzinal (aluminum brass) for harbor water, Muntz metal for fresh water, Duronze IV for aerated brackish water, Cupro-Nickel for most severe service and U. S. Navy requirements, and Arsenical copper for resisting corrosion better than straight copper.

Duplex tubing; for two different types of corrosion inside and outside of tubing which are too severe for a single alloy. Steel, stainless steel, aluminum on outside or inside in combination with Admiralty brass, aluminum brass, copper or cupro nickel, used for oil refining, refrigeration systems, chemical plants and food processing.

Copper water tubing; for industrial applications, and for pipe lines on board ship; also for air conditioning.

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BRONZOCHROM—Eutectic Welding Alloys Co., New York 13. For hard over-laying against frictional wear on ferrous and nonferrous metals. These rods have low bonding temperatures. Welds are hard and have low frictional coefficients. Can be applied in thin layers without distortion or stresses.

1 2 3 - - - - - - - -
BUFFALO Wire Cloth—Buffalo Wire Works Co. Inc., Buffalo. Wire cloth for every industrial use. Screens for abrasive material, chemicals and powder in plain steel, tinned, brass, copper, bronze, monel and stainless steel. Also galvanized after woven wire cloth.

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BUNDYFLEX Tubing—Everhot Products Co., Chicago '12. Copper fused and copper coated on both inside and out steel tubing which can be bent to any shape, hard or soft soldered, brazed or welded and used for many purposes for which ordinary copper tubing was previously required. Strong and has high resistance to vibration fatigue. Used on passenger cars and trucks as fuel lines, oil filter lines, hydraulic brake lines, etc., also on oil burners, refrigerators, farm tractors, airplanes, etc.

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BUNTING—Bearing Bronzes—The Bunting Brass & Bronze Co., Toledo, O. Precision machined cored and solid bar stock. Over 1000 sizes of standardized fully-finished stock bearings for machinery applications. All cast in accordance with bearing bronze specification SAE 660 (QQB-691, Grade 12). Special sizes made to blueprint from SAE, AMS, ASTM, Federal Navy and Air Corps specifications and from the company's recognized standard bronze bearing alloys, viz:

No. 72 (SAE 60); copper 83, tin 7, lead 7 and zinc 3. General-purpose bearing bronze.

No. 27; copper 80, tin 10 and lead 10. General-purpose bearing bronze.

No. 96; copper 87.5, tin 10 and lead 2.5. For severe service, heavy pressures.

No. 98; copper 88, tin 10 and zinc 2. Hard bronze for severe service and heavy pressures. An allowance of 1 per cent lead content improves machinability and bearing characteristics without impairing the physicals. Used in aviation engines.

No. 124; copper 85, tin 5, lead 9 and zinc 1. Excellent in automotive camshaft and piston pin applications.

No. 125; copper 75, tin 5 and lead 20. Good antifriction properties.

No. 164; copper 86, tin 11, lead 1.5 and nickel 1.5. Gears and synchronizer rings.

No. 178; copper 68, tin 4 and lead 28. Main and connecting rod applications.

No. 170; lead 75, tin 10 and antimony 15; babbitt metal.

No. 116; tin 86, copper 7 and antimony 7; genuine babbitt metal.

Aviation and machine tool bearings and transmissions cones are sand, chilled or centrifugally cast and machined to the utmost precision dimensions and surface finishes.

See advertisement, Page 301

1 - - - - - - - 8 - -
BYERS Genuine Wrought Iron—A. M. Byers Co., Pittsburgh 30. Two-component metal of high purity iron and iron silicate; furnished in rough bars or billets, finished rods or bars, tubing, sheets, plate and pipe for forging, welding, turning, boring, etc. Recommended heat treatment: after severe fabrication, heat to about 1300-1400 deg F and allow to cool slowly. Mechanical properties: ult ts, 40,000 psi; yield point 24,000 psi; elongation in 8 in. (min), 14 per cent; Bhn, 97-105; Rockwell B 55-60; sp gr, 7.70; magnetic; good weldability. Resists corrosion caused by various chemical and electro-chemical reactions; abrasion resistance, high. For any part where resistance to corrosion and/or fatigue is essential.
The company also produces other standard alloys and stainless steels of both open hearth and electric furnace grades.

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CAMBRIDGE—Cambridge Wire Cloth Co., Cambridge, Md. A wire cloth used for conveyor belts in processing, mechanical, food, glass, ceramic and metalworking fields.

1 2 3 - - - - - - - -
CARBOLOY—Carboloy Co. Inc., Detroit. A series of cemented carbides basically made from tungsten carbide and a softer cementing element such as cobalt. In certain grades, supplementary ingredients are the carbides of tantalum, titanium or other metals. Has high resistance to abrasive and corrosive wear; outstanding on account of its extreme hardness, compressive strength being as high as 800,000 psi. Rockwell hardness on "A" scale 86-93. Does not rust or corrode under normal conditions. Recommended as wear-resistant inserts for machine parts subject to extreme wear such as cams, cam followers, hydraulic valve stems, seats, machine tool rests, etc.

1 2 3 4 5 6 7 - - -
CARPENTER—The Carpenter Steel Co., Reading, Pa.

1 - - 4 - - - - - -
Stainless No. 1; carbon .1, chromium 13; furnished in finished rods or bars, coiled strips for turning, boring, forging, stamping and welding; corrosion-resistant; high tensile strength. For cold-headed parts, valve trim, turbine blades, pump shafts, heat-treated parts, etc.

1 - 3 4 - - - - - -
Stainless No. 2; carbon .3; chromium 13. Used in fully hardened condition for ball bearings, ball check valves, balls, instruments, etc.

Stainless No. 2B; carbon 1, chromium 17. Uses same as No. 2 hardened balls, valve seats, etc.

1 2 - 4 - - - - - -
Stainless No. 3; carbon .15, chromium 20, copper 1. For special chemical apparatus and scale resisting parts, stampings and moldings.

1 2 - 4 - - - - - -
Stainless No. 4; carbon .1, chromium 18, nickel 8. For rolled moldings, stampings, wire parts, tubing, etc.; also has high ductility.

Stainless No. 5; carbon .1, chromium 13.5, sulphur .30. A free-machining grade for automatic screw machine parts, valve trim, pump shafts, etc. Is heat-resistant, and has a high tensile strength.

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Stainless No. 6; carbon .1, chromium 17. Uses same as No. 1 and No. 4—stampings, wire parts and moldings.

1 - 3 - - 6 - - - - -
Stainless No. 8; carbon .1, chromium 18, nickel 8, selenium .25. A free-machining grade; heat-resistant; screw machine work.

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Presto; carbon 1.05, chromium 1.4; for ball and roller bearings.

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Silico-manganese steel; carbon .6, manganese .75, silicon 2. For heavy-duty springs.

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No. 5-317; chrome-nickel steel; carbon .5, nickel 1.75, chromium 1. For gears, clutches and shafts.

No. 5 Samson; carbon .5, nickel 1.25, chromium .6. For gears and clutches.

No. 4-408; carbon .4, nickel 3, chromium .75. For clutches and shafts.

- - 3 4 5 - - - - - -
No. 158; carbon .1, nickel 3.5, chromium 1.5. For case-hardened high duty clash gears, shafts and clutch parts.

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No. 2 Samson; carbon .2, nickel 1.25, chromium .6. For case-hardened gears, roller bearings, pneumatic tool parts, etc.

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No. 4 Samson steel; carbon .4, nickel 1.25, chromium .6. For side links of silent chains, shafts, axles, etc.

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No. 3-547; nickel-steel; carbon .3, nickel 3.5. For heat-treated shafts, etc.

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No. 2-547; case-hardening nickel-steel; carbon .2, nickel 3.5. For small parts requiring hard surface and tough core.

No. 500; carbon .1, nickel 5. For turbine blades, case-hardened gears, etc.

- - 3 4 - - - - - - -
Chrome-vanadium 5-720; carbon 5, chromium .9, vanadium .2. For leaf and coil springs, gears, shafts, etc.

No. 3-427; chrome-molybdenum-steel; carbon .3, chromium 1, molybdenum .2. For aircraft and automotive parts.

- - 3 - 5 - - - - - -
No. 436; carbon .15, nickel 1.75, molybdenum .25. For case-hardened parts.

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Temperature compensator alloy; iron-nickel alloy; furnished in rough bars or billets, finished rods or bars, wire and strips for hot forging, stamping, turning, boring, etc.; permeability varies inversely as temperature. For magnetic shunts for meters, speedometers, tachometers, voltage regulators, etc.

See advertisements, Pages 286, 287

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CASTOLIN—Eutectic Welding Alloys Co., New York 13. "Low temperature" welding rods bond without melting base metals. High strength, color match, less stresses, less warping and preheating. Welds all metals. All standard methods of heating employed (gas, arc, furnace and others).

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CECOLLOY—Chambersburg Engineering Co., Chambersburg, Pa.

- - 3 4 - - - - - - -
A; carbon 3-3.2, molybdenum .12, nickel .15; is shock-resistant; vibration damping and close grain.

B; carbon 3-3.2, molybdenum .10, chromium .10; also has shock resistance; is vibration damping; has close grain in heavy sections. Is abrasion-resistant.

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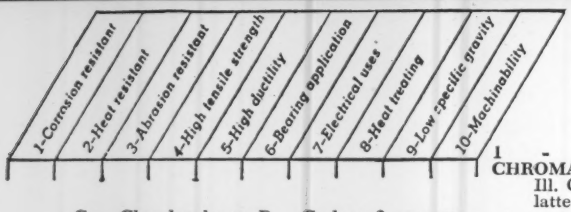
CECOLLOY IRON—Chambersburg Engineering



Co., Chambersburg, Pa. Carbon 3, manganese .90, silicon 1.8-1.9, nickel .10, molybdenum .15. Suitable for casting in cement-bonded sand molds; resists corrosion to atmospheric conditions and acids; has ts of 56,000 psi; Bhn, 200. Used for steam cylinder liners, cylinders, rings and valves; also beds for heavy-duty machine tools.

CERROBASE—Cerro de Pasco Copper Corp., New York. Bismuth-lead casting alloy which expands on cooling; melts at 255 deg F; ts 6100 psi. Recommended for autoclaves, liquid seal for nitriding furnaces, electroforming, etc.

CERROBEND—Cerro de Pasco Copper Corp., New York. Bismuth-lead-tin-cadmium casting alloy which expands on cooling and has the extremely low melting temperature of 160 deg F; ts, 6000 psi. Useful as a fusible alloy and as a filler for tube bending.

CERROMATRIX—Cerro de Pasco Copper Corp., New York. Bismuth-lead-tin-antimony casting alloy which melts at 248 deg F and expands on cooling; ts 13,000 psi. Used for locating and anchoring machine parts in cored holes.

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CHACE—W. M. Chace Co., Detroit 9.

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Thermostatic bimetal; a number of combinations including alloys of nickel-iron, nickel-iron-chromium, nickel-iron-manganese, pure nickel, brass, bronze, etc.; responsive to various temperature ranges and provide a wide range of deflection rates and electrical resistivities. For temperature control elements in controllers, recorders, indicators, circuit breakers, etc.

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No. 772 manganese alloy; manganese 72, copper 18, and nickel 10; furnished in finished rods or bars, coiled strips and sheets; for turning, boring and stamping. Mechanical properties in untreated state: Ult ts, 120,000 psi; yield point, 90,000 psi; elongation, 12 per cent; impact resistance, high; Bhn, 200; sp gr, .26 lb per cu in.; nonmagnetic; weldability, fair; heat-resistant to 500 deg F. Used where low thermal conductivity, high electrical resistivity and high thermal expansion are required.

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CHAMET BRONZE—Chase Brass & Copper Co., Waterbury 91, Conn.

Type A; copper 60, tin .75, zinc 39.25; for shafting and structural and engineering uses.

Type B; copper 62.25, tin .65, zinc 37.10; for general cold heading and upsetting purposes.

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CHASE—Chase Brass & Copper Co., Waterbury 91, Conn.

Cupro-Nickel; copper 70, nickel 30; largely used for condenser tubes particularly for extreme service in very corrosive waters.

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Leaded commercial bronze; copper 89, lead 2, zinc 9; for screw machine parts requiring good physical properties and high corrosion resistance.

Also various high and low brasses and bronzes in various forms to meet specific requirements for a variety of mechanical parts.

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CHASE Tellurium Aluminum Bronze — Chase Brass & Copper Co., Waterbury 91, Conn. Copper 88.75, aluminum 9.75, iron 1.0, and tellurium 0.5, furnished in finished rods or bars for forging, turning, boring, etc. As extruded, ts, 85,000 psi, yield strength, 33,000 psi, elongation in 2 in., 30 per cent, Rockwell B hardness, 76; sp gr, 7.59. Light drawn, ts, 95,000 psi; yield strength 60,000 psi; elongation in 2 in., 15 per cent and Rockwell B hardness, 87.

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CHASE TELLURIUM COPPER—Chase Brass & Copper Co., Waterbury 91, Conn. Copper 99.5, tellurium .5; furnished in finished rods or bars and tubing for hot forging, extruding, turning, boring, etc.; corrosion resistant; resists heat to 450 deg F; medium abrasion resistance; ts, 32-55,000 psi; medium ductility; Bhn, untreated, 90. For electrical connections, parts for electric motors, switches, etc.

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CHROMALOID—American Nickeloid Co., Peru, Ill. Chromium bonded to nickel-bonded zinc, latter serving as rustproof, flexible and inexpensive white metal base. Available in variety of brilliant finishes and patterns, as sheets, flat strips and coiled strip for continuous feed automatic presses. Can be supplied with quickly removable, gum-adhered paper covering, permitting drawing and forming without marring pre-finish.

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CHROMAX—Driver-Harris Co., Harrison, N. J. A heat-resisting alloy used for carburizing containers or furnace parts; nickel 35, chromium 19, and balance iron.

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CHROMEL—Hoskins Mfg. Co., Detroit.

Alloy 502; nickel 35, chromium 18½, balance mainly iron; supplied as castings, or as rod, bars, and strips. For general heat-resistant applications and for mechanical and load-carrying members, heated to 2000 deg F.

Alloy 670; chromium 25, nickel 12, balance mainly iron; supplied as castings or as rod, bars and strips; for high temperature applications where sulphur corrosion must be withstood.

Grade A; nickel 80, chromium 20, supplied as castings or as rod, bars, wire and strip; used for electric heating elements to 2100 deg F.

Grade C; nickel 60, chromium 16, balance mainly iron; used for electric heating elements to 1700 deg F; also for rheostatic purposes; supplied as castings, or as rods, bars and strip.

Grade D; nickel 35, chromium 18½, balance mainly iron; used for heating elements to 1400 deg F; available cast, or as wire, rod and strip, and welding wire. For mechanical purposes where heat resistance or load-carrying ability while hot are of importance.

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CHROMEWELD 4-6 — Lincoln Electric Co., Cleveland. For the welding of steels commonly known as 5 per cent chromium steels. Annealed at 1550-1600 deg F; cooled slowly and stress relieved at 1400 deg F, will have tensile strength of 80-90,000 psi; yield point, 55-65,000 psi; elong in 2 in., 24-30 per cent. Reduction in area 60-70 per cent; Bhn, 155-175.

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CIMET—Driver-Harris Co., Harrison, N. J. Nickel 10-12, chromium 26-28, and balance iron. Castings for furnace parts in high sulphur atmospheres, and for acid resisting castings in pump impellers, piping, etc.

1 2 3 4 - - 7 8 - -

CIRCLE L—Lebanon Steel Foundry, Lebanon, Pa. This tradename covers forty-eight different types of alloys and Emergency Steels including the following:

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No. A; carbon .40, silicon .40, manganese .70; ts, 92,000 psi; yield point, 50,000 psi; elongation, 23 per cent; Bhn, 180. Used for high-strength structural castings. Also available in three other grades with slightlyvarying analyses.

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No. 7; carbon .03, silicon .50, manganese .05; ts, 50,000 psi; yield point, 27,000 psi; elongation, 35 per cent; Bhn, 120. For electrical equipment and for parts requiring high magnetic permeability.

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No. 9; carbon .20, silicon .40, manganese .65 and molybdenum .50; ts, 70,000 psi; yield point, 45,000 psi; elongation, 30 per cent; Bhn, 140. For turbine parts, valves and fittings, etc., and for pressure castings at temperatures to 900 deg F. Excellent resistance to creep.

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No. 10; carbon .20, silicon .40, manganese .65, chromium 5.5, and molybdenum .50; ts, 100,000 psi; yield point, 70,000 psi; elongation, 19 per cent; Bhn, 200. For valves, fittings and pressures castings for oil refineries, etc. Combined resistance to creep and moderately resistant to corrosion. For temperatures up to 1100 deg F.

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No. 11; carbon .25, silicon .75, manganese .75, chromium 19, and nickel 1.5 max; ts, 100,000 psi; yield point, 75,000 psi; elongation, 8 per cent; Bhn, 200. For chemical apparatus. This stainless steel is capable of hardening by suitable heat treatment.

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No. 15; carbon .30, silicon .75, manganese .75, chromium 28, and nickel 1.50; ts, 60,000 psi; yield point, 35,000 psi; elongation, 3 per cent; Bhn, 190. For heat and corrosion resistance requirements.

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No. 19; carbon .15, silicon .40, manganese .65, and nickel 2.75; ts, 80,000 psi; yield point, 54,000 psi; elongation, 27 per cent; Bhn, 165. Good impact resistance at low temperatures.

No. 21; columbium-stabilized stainless steel; carbon .07, silicon 1.25, manganese .75, chromium 19.50, nickel 9.00, columbium .75; ts, 75,000 psi; yield point, 36,000 psi; elongation, 42.5 per cent; Bhn, 145. For valves, pumps and parts requiring welding in chemical and process industries.

No. 22; low-carbon stainless steel for general corrosion resistance, commonly known as KA2S; carbon .07, silicon 1.25, manganese .75, chromium 19.5, and nickel 9.00; ts, 75,000 psi; yield point, 36,000 psi; elongation, 55 per cent; Bhn, 135. For general chemical and process equipment.

No. 23; carbon .15, silicon 1.25, manganese .75, chromium 19.5 and nickel 9.00; ts, 75,000 psi; yield point, 36,000 psi; elongation, 50 per cent; Bhn, 140. Miscellaneous stainless castings for generally moderate corrosive applications in chemical and process plant equipment.

1 2 - - - - - - - -

No. 30; carbon .15, silicon 1.25, manganese .75, chromium 24.5, and nickel 11; a higher grade of stainless steel for heat and corrosion resistant requirements in chemical and process plant equipment. Ts, 85,000 psi; yield point, 50,000 psi; elongation, 35 per cent; and Bhn, 165.

No. 31; carbon .25, silicon 1.25, manganese .75, chromium 28.5 and nickel 9.5; ts, 83,000 psi; yield point, 47,000 psi; elongation, 15 per cent; Bhn, 155. For equipment where resistance to severe acid and mine waters, and sulphur atmospheres at high temperatures (as high as 2000 deg F) is required.

No. 32; carbon .35, silicon 1.25, manganese .75, chromium 15, and nickel 35; heat-resistant alloy; good strength at high temperatures; ts, 70,000 psi; yield point, 45,000 psi; elongation, 12; Bhn, 150. For furnace parts and certain process plant equipment.

No. 33; carbon .07, silicon 3.25, manganese .75, chromium 19.5, nickel 23.5, molybdenum 2.50 and copper 1.75; ts, 75,000 psi; yield point, 35,000 psi; elongation, 45; Bhn, 150. For parts subject to sulphuric acid corrosion and dilute hydrochloric acid at room temperatures.

No. 41; nickel-chrome, heat-resistant alloy; carbon .35, silicon .125, manganese .50, chromium 16.5, and nickel 66.5; ts, 80,000 psi; yield point, 35,000 psi; elongation, 15; Bhn, 160. For parts at elevated temperatures.

No. 43; carbon .35, silicon 1.25, manganese .50, chromium 18.5 and nickel 38.5; ts, 72,000 psi; yield point, 47,000 psi; elongation, 15 per cent; Bhn, 170. For parts subjected to elevated temperatures.

No. 46; special heat and corrosion-resistant alloy, suitable for weldments. Carbon .15, silicon .75, manganese .75, chromium 24, and nickel 18.5; ts, 70,000 psi; yield point, 30,000 psi; elongation, 45 per cent; Bhn, 130. For parts subjected to elevated temperatures.

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No. 106; carbon .17, silicon .40, manganese 1.3 and molybdenum .25; ts, 125,000 psi; yield point, 90,000 psi; elongation, 10; Bhn, 260. For carburized steel parts requiring tough core and hard surface.

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No 205 A; carbon .30, silicon .40, manganese .80, chromium .60, nickel .60 and molybdenum .20; ts, 95,000 psi; yield point, 62,000 psi; elongation, 23 per cent; Bhn, 180. For railway car castings, automotive and airplane parts, crankshafts, cams, gears, excavating and mixing machine parts, etc.

See advertisement, Page 160

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CLETALOY—Cleveland Tungsten Inc., Cleveland. Copper-tungsten type electrode for spotwelding. Available in four grades with high specific gravity.

CT-A: predominantly tungsten; hardness of 92-97 Rockwell B with an electrical conductivity about 38 per cent that of pure copper. In addition to spot-welding, it works well as crimper die insert for finish turning edge of steel jacket to form a seal for the porcelain stem in spark plugs.

CT-65; conductivity and tungsten similar to

1-Corrosion resistant 2-Heat resistant 3-Abrasion resistant 4-High tensile strength 5-High ductility 6-Bearing application 7-Electrical uses 8-Heat treating 9-Low specific gravity 10-Machinability

that of CT-A grade; hardness of 84-91 Rockwell B. For welding of thin stainless steel sheets, and in the upsetting of special steel which does not forge well, this grade supplies red hot surface which can withstand high pressure of small bar during knob-forming process. This grade holds original hardness especially well.

CT-86; has a higher electrical conductivity than other grades with a Rockwell B hardness of 77-83. Suitable for welding nonferrous metals and for applications where low pressures are sufficient.

LN-14; silver-tungsten-base alloy for use in applications where it shows an advantage over copper, possibly having some connection with the fact that silver oxide which might form on surface is a better electrical conductor than copper oxide.

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CLEVE-TUNG—Cleveland Tungsten Inc., Cleveland. Tungsten ground seal rod for power tubes, etc.

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CLEVITE — Cleveland Graphite Bronze Co., Cleveland. Copper-lead strip used for bearing purposes. Also complete bushings for automotive and general machine applications.

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CMP STRIP—The Cold Metal Products Co., Youngstown, O. Precision cold-rolled strip steel, carbon and alloy grades; in any gage .001-inch or heavier. All standard tempers and finishes.

See advertisement, Page 144

1 - - - - - - - - -
COLDWELD—Eutectic Welding Alloys Co., New York 13. Cast-iron welding rods and electrodes. Bonds on all ferrous and nonferrous metals except aluminum. For delicate castings where high temperatures must be avoided, such as water jackets, cylinders, compressors, crank and gear cases, etc.

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COLMONOY—Wall-Colmonoy Corp., Detroit.

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No. 1; chromium 9, boron 2, silicon 2, balance iron; welding electrode; impact resistance, high; 60 Rockwell C hardness; good weldability; high abrasion resistance. For hardfacing of parts requiring abrasion resistance such as earth-handling equipment.

1 - 3 - - - - - - 10
No. 4; chromium-nickel-boron welding rod; hardness, C-40 Rockwell; nonmagnetic; weldability, good; resists corrosion caused by most chemicals; heat-resistant to 1800 degrees Fahr.; abrasion resistance, high; for valve seats, and other work requiring both high abrasion resistance and machinability.

1 2 3 - - - - - - -
No. 5; nickel-chromium-boron welding rod; hardness, C-50 Rockwell; nonmagnetic; weldability, good; heat-resistant to 1750 degrees Fahr.; for pump sleeves, wear rings, and parts subject to combined corrosion and abrasion.

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No. 6; similar to No. 5; with hardness number of C-66 Rockwell; weldability, very good; heat resistant to 1700 degrees Fahr.; abrasion resistance, very high; for shaft sleeves, hot oil and pump parts, thrust collars, seal rings, bushings, cams, valve faces, gage anvils, plug gages, centers and centerless grinder blades.

- - 3 - - - - - - -
No. 9; chromium-molybdenum-boron-iron-silicon welding rod; anneals to Rockwell C-55 at 1550 degrees Fahr.; hardens back to C-64 at 1900 degrees Fahr. in the high compressive strength; hardness number, C-65 Rockwell; magnetic; weldability, good; abrasion resistance, high; for many parts requiring combined resistance to wear and red hardness and toughness, such as reamers.

1 2 3 - - - - - - -
No. 20; nickel-chromium-boron welding rod, fabricated into parts by sand casting, turning, boring, etc.; Rockwell hardness number, C-20; nonmagnetic; resists corrosion caused by most chemicals; heat resistant to 2000 degrees Fahr.; abrasion resistance, medium; for parts in chemical machines subject to corrosion.

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COLORSTRIP—Acme Steel Co., Chicago 8. Strip steel, electro-galvanized or plain and coated on one or both sides with any specific color (coating may be either enamel or lacquer); furnished in coils and can be fabricated by rolling or stamping; corrosion-resistant; resists heat up to 150 F; same tensile strength, elongation and hardness as standard strip steel with slight variations depending on temper and analysis of the base metal.

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COLUMBIA—Columbia Steel & Shafting Co., Pittsburgh 30. Furnished in bars. Tensile strength is high; bearing properties, good; material machines freely.

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COMMERCIAL—Buckeye Brass & Mfg. Co., Cleveland. Cored and solid bronze bars; copper 80, tin 10, lead 10. For bushings, bearings and bars.

See advertisement, Page 143

- - - - - 6 - - - -
COMPO 65-R-2—Bound Brook Oil-Less Bearing Co., Bound Brook, N. J. Porous bronze bearings and washers containing higher percentage of graphite; copper 87, tin 9.5, graphite 3.5. Porous structure contains to 15 per cent oil developed particularly for antiscuffing under heavy vibrating static loads; also heavy oscillating loads. Ult ts, 15,000 psi; ult compressive, 75,000 psi.

See advertisement, Page 302

1 - 3 4 5 - - 8 - 10
CONTINENTAL Alloy Steels — Continental Foundry & Machine Co., East Chicago, Ind.

C-1; furnished in seven grades ranging from .20-.80 carbon content; plain carbon steels.

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C-2; carbon - manganese - nickel - molybdenum cast steel for parts requiring special physical properties such as tractor frames, locomotive castings, power shovel castings, locomotive crane castings, and other machinery parts.

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C-3; carbon-manganese-molybdenum cast steel requiring special physical properties such as sprockets, spindles, gears, miscellaneous castings for power shovels, locomotive cranes, locomotive wheel centers and crossheads, and other machinery parts.

- - - - 5 - - 8 - 10
C-4; carbon-manganese-molybdenum-vanadium cast steel for pinions, axles and spindles, and other parts subject to severe service.

- - - 4 - - - 8 - 10
C-5; carbon-nickel-molybdenum cast steel for forging machinery and hammer parts, rams and sow blocks.

- - 3 - 5 - - 8 - -
C-6; carbon-high-chromium-molybdenum cast steel for special abrasive qualities suitable for various types mills, crushers, etc.

- - 3 4 - - - 8 - -
C-7; carbon-chromium-nickel-molybdenum cast steel designed for machinery or other parts subjected to especially severe wear, strength and impact service.

C-10; carbon-chromium-molybdenum cast steel for forging dies, tools etc. All of the above steels are especially heat-treated to give desired physical properties.

- - 3 - - - - - - -
"Chrome-Molybdenum"; chromium-molybdenum alloyed steel rolling mill rolls for blooming, bar, billet, structural and merchant mills; also backing-up rolls for strip mills.

- - - - - - - 8 - -
"Heat-Treated Alloy"; chromium-nickel-molybdenum rolling mill rolls for billet, blooming, merchant and bar mills.

- - 3 - - - - - - -
Special; nickel-chromium alloyed steel for rolling mill rolls for use in billet, bar, structural and merchant mills where resistance to wear is prime factor.

See advertisement, Page 278

1 2 3 - - - - - - -
COOPER ALLOYS—The Cooper Alloy Foundry Co., Hillsdale, N. J. Numerous castings of stainless steel, monel, nickel, chrome-iron, chrome-nickel and other special alloys, for various applications.

- 2 - - - 6 7 - - -
COPEL—Hoskins Mfg. Co., Detroit. Copper 55, nickel 45; used mostly for electrical resistance purposes, also for heating elements to 800 deg F. Temperature coefficient of resistance is practically nil.

1 - - - - - 7 - - -
COPPERWELD—Copperweld Steel Co., Glassport, Pa. Copper-covered steel in steel wire or rod, with copper exterior permanently welded (cast) to the steel core; resists rust and corrosion; provides adequate electrical conductivity for many electrical uses and rust-resisting high strength for many mechanical uses. In its Warren, O. plant the company also produces aircraft steels, stainless steels, Nitralloy steels, bearing steel, and carbon and alloy tool steels.

- - 3 - - 6 - - - -
CRAMP ALLOYS—Cramp Brass & Iron Foundries Division Baldwin Locomotive Works, Philadelphia.

No. 49; furnished in rough bars or billets, rods or bars, and sand castings; resists heat to 400 deg F; high abrasion resistance; ts 120,000 psi; compressive, 55,000; medium ductility; sp gr, 6.8; good bearing properties. Used for heavy-duty, slow-moving loads.

No. 99; furnished in rough bars or billets and rods or bars; resists corrosion by sulphuric, sulphurous, acetic acids; heat-resistant to 450 deg F; high abrasion resistance; ts, 55,000 psi; compressive, 22,000; good bearing properties; Bhn, untreated 100. Used for high-speed bearings and acid-resisting parts.

- - 3 - - - - - - -
CRASFLOY—Continental Foundry & Machine Co., East Chicago, Ind. Hard alloy grain iron rolling mill rolls made in four grades: mild, medium, hard and super hard for rolling hot and cold strip, sheets and plate.

See advertisement, Page 278

- - 3 - - - - - - -
CROMONITE—Continental Foundry & Machine Co., East Chicago, Ind. Hard alloy chill roll made in four grades: mild, medium, hard and super hard for hot and cold strip rolling.

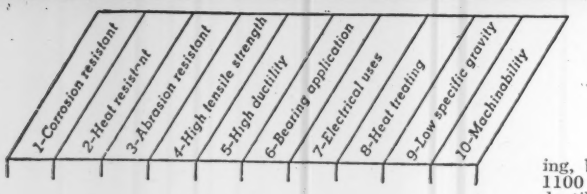
See advertisement, Page 278

1 - - 4 - - 7 - - -
CUPALOY—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Copper-base alloy containing chromium and silver; thermal and electrical conductivity 80-90 per cent pure copper; tensile properties of steel: Bhn 140-160; applications include spot-welding tips, seam-welding wheels and rolls, mechanical parts carrying heavy current, etc. Licensee: A. W. Cadman Mfg. Co., Pittsburgh.

- 2 3 - - - - - - 10
CUPRODIE—A. Finkl & Sons Co., Chicago. A .50 carbon, chromium, nickel, molybdenum, copper for die blocks, inserts and bars; furnished heat-treated to various tempers, all commercially machinable to 477 Brinell number. For drop hammer dies and inserts also forging machine dies. Material is heat and abrasion-resistant.

1 2 - - - - - 7 - - -
CUPRON—Wilbur B. Driver Co., Newark, N. J. Copper 55, nickel 45; in rough bars or billets, finished rods or bars, wire and coiled strips. Mechanical properties in untreated state; ult ts, 62,000 psi; percent elongation, hard 2—soft 40; sp gr, 8.9; nonmagnetic; weldability, good; heat-resistant to 1500 deg F; abrasion resistance, high. For electrical uses.

1 2 - - 5 - - - - -
CUPRO-NICKEL, 30 per cent—Revere Copper & Brass Inc., New York 17. Copper 70, nickel 30; furnished as finished rods or bars, tubing, sheets, strips (coiled) and plates; for fabricating into parts by stamping, extruding, welding, deep drawing or cold forging. Resists heat to 500 deg F; abrasion resistance, medium; ts, ult 50-90,000 psi; ductil-



ity, high; sp gr, 8.95. For marine condenser tubes and condenser plate, cold-headed bolts and parts, etc.

D

1 - 3 - 5 - - - - - -
D-H-S BRONZE—Koppers Co., Bartlett Hayward Div., Baltimore. In rough bars or billets, rods or bars, also as sand castings; zinc 21-25, copper 61-65, hardener (aluminum, manganese and iron) 13-15; resists corrosion, heat-resistant to 400 degrees Fahr.; high abrasion resistance; tensile strength, 100-130,000 psi; compressive, 90,000; elastic limit, 40.000-65,000 psi: elongation in 2 in., 20-11 per cent; sp gr, .278 psi; nonmagnetic; brinell hardness, untreated 200-240; for heavy-duty bearings, gears, guides, screws, stems, nuts, etc.

1 - - 4 5 - - - - - -
The company also offers a special D-H-S Bronze (analysis confidential); furnished in rough bars or billets, finished rods or bars and plates, and as sand and centrifugal castings. Ts, 100-130,000 psi; compressive, 65-90,000 psi; yield point, 50-75,000 psi; elongation, 10-18 per cent; impact resistance, high; Bhn, 195-240; sp gr, .278; nonmagnetic; heat-resistant to 400 deg F; abrasion resistance high. For slow-speed bearings, high pressure parts, high pressure valves, compression parts, gears, worms, etc.

1 - - - - - - - - - -
DAIRYWHITE—Arthur Harris & Co., Chicago 7. Copper-nickel alloy, copper 67, nickel 23, balance zinc, lead and aluminum. For food machines, dairy machines, etc.

- - - - - - - - 8 - -
DAMASCITE—Chrysler Corp., Amplex Div., Detroit. A ferrous, nonporous high-density material used as parts and shapes; ts, ult 80.000 psi; readily machined; heat-treatable; high magnetic properties.

- - - - 5 6 - - - -
DEFENDER METAL—Magnolia Metal Co., Elizabeth, N. J. Lead-tin-antimony alloy furnished in ingots, as substitutes for tin-base babbitts. Mechanical properties in untreated state: ult ts, 16,000 psi; yield point 7685; impact resistance, medium; Bhn, 20; resists corrosion caused by lubricating oils; abrasion resistance, medium. Used for internal combustion engines, trap rock crushers and sifter machinery.

1 - 3 - - 6 - - - - -
DELLOY METALS—Delloy Metals, Philadelphia 33. A cast alloy of chromium, cobalt, and tungsten. Mechanical properties: ult ts, 54.-000 psi; compressive, 325,000 psi. For bearing applications.

No. 6; cobalt 43, chromium 33.4, tungsten 19.1, carbon 2.7 and other alloying elements 1.8. Hardness, Rockwell C, 62-64.

No. 9; cobalt 47.9, chromium 31.0, tungsten 17.2, carbon 2.0, and other alloying elements 1.9.

- - 3 - - - - 8 - -
DEWARD—Allegheny Ludlum Steel Corp., Brackenridge, Pa. Carbon .9, manganese 1.5, molybdenum .3. For holders for thread chasers and gang punches. Oil hardening.

See advertisement, Page 157

- 2 - 4 - - - 8 - -
DM-45—Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O. Carbon .4-.5, manganese .4-.7, silicon .5-.8, chromium 1-1.5, molybdenum .45-.65; furnished in rough bars or billets, and finished rods or bars; for hot forging, turning, boring, etc., into parts. Resists heat to 1100 deg F; ts, 150,000 psi, min, heat-treated; medium ductility; Bhn, untreated 185; heat-treated 411 max. For bolts, studs and other highly-stressed parts used at elevated temperatures.

1 2 - - - - - 8 - -
DM STEEL—Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O. Carbon .15 max, manganese .3-.6, silicon .5-1, chrome 1-1.5, molybdenum .45-.65, phosphorus .03 max, sulphur .03 max; furnished in rough bars or billets, finished rods or bars, and tubing, for hot forging, welding, turning, boring, etc. into parts. Resists heat to 1100 deg F, ts, ult, 60,000 psi min: medium ductility; fair weldability; and Bhn, annealed, 163 max. Used for oil refinery field.

1 2 3 - - - - - - -
DODGE Steel Castings—Dodge Steel Co., Tacony, Philadelphia. Electric steel castings, both carbon and alloy; used particularly for turbine, pump, valve and pressure castings.

- - - - - - 6 - - - -
DOLE THERMOSTATIC BIMETAL—The Dole Valve Co., Chicago. In strips and fabricated elements; for stamping and coiling; good magnetic properties; good weldability; recommended heat treatments are 600-700 deg F, free end of thermal element deflects proportionately with changes in temperature. Used to provide protection against excessive temperature and temperature control at predetermined temperatures.

1 - - 4 - - - - - - -
DOLER-ALUMIN—Doehler Die Casting Co., New York. Aluminum base die castings. Composition suited to meet stringent requirements such as high tensile strength, impact strength, hardness, corrosion resistance, thermal conductivity and electrical conductivity.

1 2 - 4 - - - - - - -
DOLER-BRASS—Doehler Die Casting Co., New York. Brass die castings. Composition suited to meet varying conditions. Ts, to 100,000 psi, and Bhn, to 180, excellent corrosion resisting properties.

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DOLER-MAG—Doehler Die Casting Co., New York. Magnesium base die castings made from the lightest of the commercial metals; one-third lighter than aluminum.

- - - - 4 - - - - - -
DOLER-ZINK—Doehler Die Casting Co., New York. Zinc base die castings of maximum tensile and impact strength.

- - - 4 - - - - 9 10
DOWMETAL—The Dow Chemical Co., Midland, Mich. Magnesium alloy ingots, castings, wrought forms, rods, bars, sheet, shapes, extrusions, sand and die castings; also forgings, magnesium metal ingots and magnesium metal sticks. Available in various types:

C; aluminum 9, manganese .1, zinc 2, remainder magnesium; in ingots for sand casting; ult ts, 40,000 psi; ult compressive, 60,-000; yield strength, 16,000; elongation, 10 per cent; impact resistance, high; high elastic resilience; sp gr, 1.82; nonmagnetic; resists corrosion caused by caustic chromic acid, hydrofluoric atmospheres, etc. Used for reciprocating parts and housings.

FS-1; aluminum 3, manganese .3, zinc 1, remainder magnesium; in rough bars or billets, finished rods or bars, tubing, sheets, coiled strips, plates; for extruding, rolling, drawing and pressing; ult ts, 40,000 psi; yield strength, 30,000; compressive, 50,000; elongation, 16 per cent; endurance limit (completely reversed bending), 14,500 psi; sp gr, 1.77; nonmagnetic; high elastic resiliency. Used for aircraft parts and other applications requiring light weight.

H; aluminum 6, manganese .2, zinc 3, remainder magnesium, in ingots for sand casting; ult ts, 40.000 psi; yield strength, 14,-000; compressive, 46,000; elongation, 12 per cent; impact resistance, high; high elastic resilience; sp gr, 1.83; resists corrosion caused by caustic, chromic acid, hydrofluoric atmospheres, etc. Used for aircraft parts and other applications requiring light weight.

J-I; aluminum 6.5, manganese .2 zinc 1, remainder magnesium; in rough bars or billets, finished rods or bars, tubing, sheets, coiled strips, plates; for hot forging, extruding, rolling, drawing and pressing; ult ts, 45,000 psi; yield strength, 32,000; ult compressive, 69,000; elongation, 15 per cent; endurance limit (completely, reversed bending), 18,000 psi; sp gr, 1.8; nonmagnetic; high elastic resilience. For structural parts and fabricated housings.

M; manganese 1.5, remainder magnesium; in the same form as for sand casting, hot forging, rolling, drawing and pressing. Mechanical properties in rolled state: Ult ts, 37,000 psi; yield strength, 29,000; elongation 8 per cent; impact resistance, high; sp. gr, 1.76; nonmagnetic; weldability, good; heat-resistant to 400 deg F; high elastic resiliency. For parts requiring best formability of magnesium alloys.

O-1; aluminum 8.5, manganese .2, zinc .5, remainder magnesium; in rough bars or billets, finished rods or bars and tubing; for hot forging and extruding. Mechanical properties in heat treated state: Ult ts, 50,000 psi; yield strength, 34,000; ult compressive 75,000; elongation, 5 per cent; impact resistance, high; endurance limit (completely reversed bending), 16,000 psi; sp gr, 1.8; nonmagnetic; high elastic resiliency. For structural parts requiring maximum strength.

R; aluminum 9, manganese .2, zinc .6, remainder magnesium; in ingots for die casting. Mechanical properties in untreated state: Ult ts, 33,000 psi; yield strength, 22,000; elongation 3 per cent; impact resistance, high; sp gr, 1.74; abrasion resistance, medium; nonmagnetic. For housings and structural parts.

1 2 - - - - 7 - - -
DRIVER-HARRIS—Driver-Harris Co., Harrison, N. J.

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No. 42 alloy; notable for its coefficient of linear expansion—approximately that of different grades of glass.

1 2 - - - - 7 - - -
No. 52; alloy of nickel and iron has been successfully used for sealing in glass and in which process no coating is required prior to the operation. It is corrosion and heat-resistant.

1 2 3 - - - - - - -
DURALOY—Duraloy Co., Scottdale, Pa. High-chrome, iron and chrome-nickel alloys in a number of different grades with minor and major variations in analyses to meet a wide variety of requirements.

1 2 3 - - - - - - -
DURASPUN—Duraloy Co., Scottdale, Pa., Centrifugal castings including tubing with a wide range in wall thicknesses, and odd shapes such as materials conveyor screws. Material is corrosion, heat and abrasion-resistant.

1 2 - - - - - - - -
DURCO—Duriron Co. Inc., Dayton, O. Alloy steels (KA2S, KA2SMo., etc): 18 chrome, 8 nickel, carbon max .07, and other standard as well as special analyses preferred by users. For pumps, valves, fittings, castings for corrosive service, etc.

- - - - - 6 - - - -
DUREX—Moraine Products Div., General Motors Corp., Dayton, O. Products of powder metallurgy in iron, bronze and other metals: self-lubricating bearings and various small parts for electric motors, instruments, aircraft, appliances, automotive equipment, farm equipment, washing machines, etc.

See advertisement, Page 162

1 - - - - - - - - -
DURFACE—Eutectic Welding Alloys Co., New York 13. Wear-resistant alloy welding rod (gas and arc) for building up on steel, manganese steel and cast iron.

1 - 3 - - - - - - -
DURICHLOR—Duriron Co. Inc., Dayton, O. Silicon 14.5, molybdenum 4, carbon .80, traces of phosphorus and sulphur, balance iron. For pumps, valves, pipe, castings for corrosive service, especially for hydrochloric acid and chloride solutions.

1 2 - - - - - - - -
DURIMET—Duriron Co. Inc., Dayton, O.

T; nickel 22, chromium 19, silicon, molybdenum and copper, 5 approx., carbon .07 max, balance iron. For pumps, valves, bolts, nuts and castings for corrosive service, especially weak sulphuric acid.

20; nickel 29, chromium 19, silicon, molybdenum and copper 8, carbon .07 max, balance iron. For pumps, valves and castings only for corrosive service, especially hot, weak sulphuric acid of strengths higher than recommended for Durimet T.

1 - 3 - - - - - - -
DURIRON—Duriron Co. Inc., Dayton, O., and licensees. Silicon 14.50, carbon .8, manganese .6, sulphur and phosphorus traces, balance iron. For pumps, valves, exhaust fans, mixing nozzles, and castings for handling acids and other corrosive liquids and gases.

- 2 3 4 - - - - - -
DURODI—A. Finkl & Sons Co., Chicago. A .50 carbon, chrome-nickel-molybdenum furnished in inserts, bars and shaped pieces.

1-Corrosion resistant | 2-Heat resistant | 3-Abrasion resistant | 4-High tensile strength | 5-High ductility | 6-Bearing application | 7-Electrical uses | 8-Heat treating | 9-Low specific gravity | 10-Machinability

heat-treated to various tempers, all commercially machinable; also annealed for hardening in oil or in air blast. For forging machine dies, inserts and mandrels, drop hammer dies and forging press dies.

1 - - 4 - - - - - - - -
DURO-GLOSS—Jessop Steel Co., Washington, Pa. Stainless steels in following grades:

C-1, type 410; ult strength, 70,000 psi; yield point, 40,000; elongation in 2 in., 35 per cent. Used for automotive, chemical and electrical appliance equipment, gates and valves, etc.

C-2, type 430; ult strength 80,000 psi; yield point, 50,000; elongation in 2 in., 35 per cent; Bhn., 163. Used for chemical plant equipment, condensers, steam engine parts, pump shafts, fans, blowers, restaurant equipment, etc.

C-3, type 442; ult strength 80 000 psi; yield point, 55,000; elongation in 2 inches, 35 per cent; Bhn., 171. Used for same type of applications as C-4, but intended for use at slightly lower temperatures.

C-4, type 446; ult strength 90,000 psi; yield point, 55,000; elongation in 2 in., 25 per cent; Bhn., 171. Used for tubes, manifolds, linings, etc.

1 - - 4 - - - - - - - -
DURONZE ALLOYS — Bridgeport Brass Co., Bridgeport, Conn. High copper-silicon bronzes alloyed with elements such as tin, iron, aluminum, etc. Possess high strength combined with corrosion resistance.

I; possesses excellent cold working properties; for making cold-headed bolts and screws, average 100,000 psi ts; in rod, wire and sheet form.

II; hot-rolled sheet for making range boilers, automatic heaters and storage tanks by either electric arc or oxyacetylene welding methods; cold-rolled strip used as a substitute for phosphor bronze spring metal; rod and wire used for making hot-headed bolts and screw products; supplied in sheet, rod, wire, and ingot forms.

III; supplied in rod form only; tensile strength from 85,000-100,000 psi; hot forgings 90,000 psi; free-machining for making screw machine parts, also for sucker rods for corrosive oil wells; ten per cent lighter than brass; excellent corrosion resistance. In ingot form may be used for making sand castings with ts about 70.000 psi. Used for compression fittings for oil and gas lines in airplane construction, sliding parts for machine guns, small gears, screws, pinions, valve parts, etc.

IV; made into condenser tubes only; for resisting corrosion from aerated sea water mixed with fresh water and acid wastes, sewage, etc., often found in harbors. Also for conveying hot brine solutions in salt refining.

V; wire for making difficult cold-headed parts, screws, bolts, rod, sheet. Malleable; good corrosion resistance; ts. about 100.000 psi. Recommended for cold-headed bolts and outdoor use. Also tubing for hydraulic lines on aircraft.

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DUTCH BOY BABBITT—National Lead Co., New York 6. Analysis of the material varies according to the bearing application.

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DYN-EL—Alan Wood Steel Co., Conshohocken, Pa. Furnished in sheets, strips, and plates, for stamping, welding, cold and hot forming, etc.: abrasion resistance, medium; ts, 70-80 000 psi; ductility, high; weldability, good; fatigue and impact values, high. For structures requiring high strength.

E

1 - - 4 5 - - - - -
EASY-FLO—Handy & Harman, New York 7. Brazing alloy; flows at 1175 deg F; silver 50, copper 15.5, zinc 16.5, cadmium 18; resists corrosion due to silver content; sp gr 9.49. For brazing ferrous and nonferrous metals, particularly dissimilar metals and monel metal, stainless steel and other copper-nickel and chrome-nickel alloys. Has many electrical uses. Also Easy-Flo No. 3 for fabrication of large copper piping, etc.

1 - - 4 5 - - - - -
ECLIPSE Seamless Flexible Metal Hose — Metal Hose Div., Bendix Aviation Corp., Philadelphia 44. Bronze 85/15, or 3 per cent silicon, steel, aluminum, silver and various other alloys. Tubing resists corrosion caused by salt water, ammonia, steam, gases, etc., and heat up to various degrees Fahr. Has high ductility and can be used where flexible tubing is required.

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ECONOMO—Wheelock Lovejoy & Co., Inc., Cambridge, Mass. Carbon .2 and .5 with alloy of molybdenum; free machining; for machine tool parts.

- 2 3 - - - - - - -
EIS 45—Heppenstall Co., Pittsburgh. Carbon .85, chrome 12. Furnished for hot forging into parts. Used for shear blades for shearing medium heavy material.

1 2 - - - - - - - -
EIS 57—Heppenstall Co., Pittsburgh. Nickel-chrome-molybdenum-steel, .6 carbon; for insert and hot die steel service.

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ELASTUF Type A-2—Horace T. Potts Co., Philadelphia. Chrome-vanadium with nickel-molybdenum heat-treated alloy steel, stress relieved; furnished in rough bars or billets, finished rods or bars; for forging, turning, boring, etc. Ult ts. 150,000 psi; compressive, 150,000 psi; yield point, 125,000 psi; elongation, 17-22 per cent; impact resistance, medium; endurance limit, high; heat resistant to 1100 deg F; abrasion resistance, high. For shafts, gears, axles, and other machine parts requiring high strength.

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ELASTUF CHRO MOLY (Modified)—Horace T. Potts Co., Philadelphia.

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NE 9450—heat-treated; special chrome-nickel-molybdenum alloy steel of National Emergency type; heat-treated to high physical properties for uses requiring high tensile, fatigue and impact strength. Furnished in machinable condition.

- - - 4 - - - 8 - 10
NE 9445—9450 hot-rolled, annealed, readily machinable alloy; for parts requiring heat treatment after machining.

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NE 8720—hot-rolled, annealed, readily machinable alloy; for carburized parts requiring high core strength.

- - - 4 - - - - - 10
ELASTUF PENN—Horace T. Potts Co., Philadelphia. Hot-rolled steel furnished in rough bars or billets, and finished rods or bars for hot forgings, turning, boring, etc.; ts, 125,000 psi; medium ductility. Used where maximum strength in a carbon machinery steel is required or where untreated alloys of simpler type have been used.

ELECTROMET — Electro Metallurgical Sales Corp., New York 17. A complete line of ferro-alloys and alloying elements of various analyses.

See advertisement, Page 150

1 - - - - - - - - - -
ELECTRUNITE—Steel and Tubes Division, Republic Steel Corp., Cleveland 8. Electric-welded tubing in stainless, carbon, and various alloy steels. Square, rectangular, oval, or other shapes, in any size or gage where the periphery of the shape is not less than 2-1/32 in. or more than 16 in. Used for general mechanical, structural, aircraft, conduit, boiler, condenser, heat exchanger and other pressure applications.

1 - - - - - - - - - -
ELEPHANT BRAND Phosphor Bronze — The Phosphor Bronze Smelting Co., Philadelphia. Furnished in wire, sheets, rods and castings.

Sheets in rolls, slit sheet metal, tinned both sides; in various gages and tempers covering a broad range of uses.

Wire in coils for springs, flat wire, in coils or lengths; tinned binding for armature work, binding wire (round), dead soft to any temper required, straightened (round), in lengths.

Rods in complete range of sizes from rounds .010-4¾ in., hexagons ⅛-2¼ in., and squares ¼-2¼ in. Also in many rectangular and special shapes. For parts subject to corrosion, fatigue, wear, shock and abrasion.

Castings; special alloys for bearings, gears, valves, etc. Also 214 stock bushings sizes carried in stock.

- - 2 - 4 - - - 7 - - -
ELKALOY—P. R. Mallory & Co. Inc., Indianapolis. A work-hardened alloy of copper, not heat-treatable, for spot and seam welding aluminum and its alloys, unpickled hot-rolled steel, terne plate, tin plate, galvanized iron and other materials. A direct substitute for copper, it handles the same but is harder and lasts longer.

- - 2 3 - - - 7 - - -
ELKONITE—P. R. Mallory & Co. Inc., Indianapolis. Three definite classes of materials.

One group based on copper and such refractory metals as tungsten, molybdenum and their carbides—combinations which produce material with good electrical conductivity and great wear-resistant qualities, for use as welding electrodes and contactors in oil immersed circuit breakers. Certain of these grades are heat treatable. The heat treatment improves electrical and physical properties.

Second group based on silver and refractory material such as tungsten, molybdenum, and their carbides, and has been developed primarily as a facing material for heavy-duty electrical contacts and contactors for air breakers.

Third group comprises basically silver in which is incorporated refractory material such as cadmium oxide or nickel. These materials are used as heavy contacts, particularly for aircraft relays, and contact facings and main contacts on heavy-duty breakers.

All three groups can be used in the form of thin facings or as inserts with copper or copper alloy baking materials, having high electrical conductivity coupled with high physical properties.

- - - - - - - 7 - - -
ELKONIUM—P. R. Mallory & Co. Inc., Indianapolis. A series of electrical contact materials divided into the following groups: Silver, platinum, palladium and gold-base alloys. These groups are designed to cover a wide range of applications and can be supplied in a wide variety of forms.

- - 3 - - - - - - -
ELVERITE—Babcock & Wilcox Co., New York. Sand-cast and chill-cast wear irons for tube mill liners, roll heads, jaw crushers and special applications.

1 2 - - - - - - - -
ENDURO—Alloy Steel Div., Republic Steel Corp., Massillon, O. Stainless and heat-resisting alloy.

Chromium-nickel group:

17-7; chromium 17, nickel 7, carbon .09-.2. Used for automotive trim and for deep drawing where straight chromium types are not sufficiently ductile. Primarily for high tensile strength.

18-8; chromium 18, nickel 8, carbon cont. .08-.2; especially suited to resist atmospheric corrosion and corrosion reagents. For dairy and chemical plant equipment, food and meat processing machinery, high-strength lightweight structural members, and for resistance to oxidation at elevated temperatures.

18-8-S; similar to 18-8 except carbon is kept under .08 which permits its use in welded equipment subject to severe corrosion.

18-8-FS; a special modification of 18-8 to develop greater softness and less work hardening; better adapted to successive drawing and spinning operations with less annealing than 18-8.

18-8-STi; 18-8-S to which titanium has been added for eliminating intergranular corrosion at high temperatures. Used for airplane collector rings and exhaust manifolds, and other high temperature requirements.

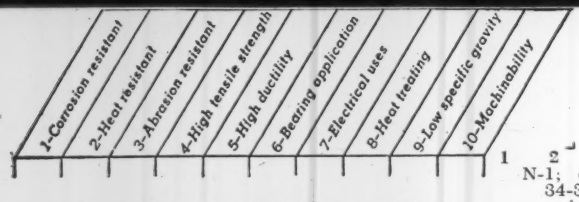
18-8-SCb; 18-8-S plus columbium; for applications similar to those for which 18-8-STi is recommended. More efficient as carbide stabilizer and better corrosion resistance than titanium.

18-8-SMo; 18-8-S plus 1.75-2.5 molybdenum; resistant to acids encountered in paper and pulp processes, woolen dyeing and in chemical and pharmaceutical industries. Recommended for severe corrosive conditions: good fabricating and welding properties.

18-8-B; 18-8 with 2 to 3 silicon; for resistance to oxidation in temperatures up to 1700 deg F. For annealing boxes, etc.

18-8-FM; a free-machining type of 18-8 through addition of .07 min. selenium; machinability very good for chromium-nickel type—about 70 per cent that of screw stock. Corrosion resistance same or little less than 18-8.

HCN; chromium 25, nickel 12; for resistance



to oxidation up to 2000 deg F; fabricates, machines, and welds readily. High strength and creep at elevated temperatures. Not recommended for high sulphur conditions at high temperatures.

NC-3; chromium 25, nickel 20, silicon 1.5 max; for maximum heat resistance. Best strength and creep at high temperatures, but may be attacked if sulphur present in gases. Resistant to carburizing.

Straight chromium group:

S-Turbine Quality; chromium 11.5-13, carbon .15 max. Used for applications where corrosion resistance and physical strength are needed at medium high temperatures.

S-High Carbon; a straight chromium, high-carbon grade for heat treating for high hardness applications.

S-1; chromium 11.5-13.5, carbon .15 max., responds readily to heat treatment and is recommended where strength, toughness and hardness are required; for pump shafts, valve seats and stems, nuts and bolts, etc.

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ERMAL—(Z-Metal)—Erie Malleable Iron Co., Erie, Pa. A spheroidized pearlitic-malleable iron; for castings requiring rigidity, high tensile strength, and abrasion resistance. Suitable for heat treatment.

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ERMALITE—Erie Malleable Iron Co., Erie, Pa. Wear-resisting alloy iron; for wearing plates, friction drums and other parts subject to high stresses or wear.

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EVANSTEEL—Chicago Steel Foundry Co., Chicago. Nickel 1-1.5, chromium 0.65-1, carbon varies from .3-.5, sometimes carries additions of vanadium or molybdenum. For castings such as passenger car knuckles, tooth bases, sprockets, gears, high pressure valves, etc.

1 - - 4 5 - - - - - 10
EVERDUR—American Brass Co., Waterbury, Conn.

Alloy No. 1010; copper 95.8, silicon 3.1, manganese 1.1. Uses include welded tanks and sewage disposal apparatus.

1 - - 4 - - - - - - 10
Alloy No. 1012; copper 95.60, silicon 3.00, manganese 1.00, lead 0.40; made in rod only for automatic screw machine production.

Alloy No. 1014; copper 91.00, silicon 2.00, aluminum 7.00; made in rod only for automatic screw machine production and hot forging.

1 - - 4 5 - - - - - -
Alloy No. 1015; copper 98.25, silicon 1.5, manganese .25; easily fabricated by all methods including welding. Used for tubes, bolts and screws.

Alloy No. 1000; casting alloy; copper 94.9, manganese 1.1, silicon 4.

See advertisements, Pages 279-282

F

1 2 3 - - - - - - - -
FACEWELD—Lincoln Electric Co., Cleveland. Coated-type electrodes for hard-facing worn parts of straight carbon, medium carbon or manganese steel to resist severe abrasion and moderate impact.

No. 1 (yellow tip); deposits of single layer have hardness of 45-52 Rockwell C. Multiple layers have hardness of 52-58 Rockwell C. Toughness of this deposit is greater than that of No. 12.

No. 12 (red tip); single layer hardness is 52-57 Rockwell C. Multiple layer hardness is 55-59 Rockwell C.

1 2 3 - - - - - - - -
FAHRALLOY—The Fahralloy Co., Harvey, Ill. High nickel-chrome, depending on analysis; furnished as castings; heat-resistant to 2100 deg F. Used for furnace parts, quenching fixtures, carburizing pots, etc.

1 2 - 4 - - - - - - -
FAHRITE—The Ohio Steel Foundry Co., Springfield, Ohio.

1 2 - - - - - - - - -
N-1; carbon .4-.6, chromium 15-18, nickel 34-38; in rods, bars and sand castings; resists oxidation to 2000 deg. F; has high strength and ability to withstand thermal shock at high temperatures; good weldability; ult ts, 70,000 psi; sp gr, 7.94; Bhn, as cast 165-185. For chain links, retorts and furnace parts.

1 2 - 4 - - - - - - -
N-3; carbon .3-.5; nickel 10-13; chromium 24-27; in rods, bars, sand castings and centrifugal tubes; resists oxidation to 2000 deg F and corrosive attack in sulphur atmosphere; has high strength at elevated temperatures; good weldability; ult ts, 90,000 psi with 20 per cent elongation; sp gr, 7.73; Bhn, as cast 165-175. For tube supports, baffles, dampers, boxes, trays and retorts.

1 2 - - - - - - - - -
N-61; carbon .4-.75, nickel 59-62, chromium 10-15; in sand castings; resists oxidation to 2000 deg F; good weldability; ult ts, 70,000 psi; sp gr, 8.13; Bhn, as cast 175-185. For carburizing furnace parts.

C-28; carbon .35 max, nickel 3 max, chromium 25-30; in sand castings; resists oxidation to 2100 deg F; but has low high temperature strength; highly resistant to sulphur gas atmosphere; poor weldability; ult ts, 90,000 psi with 18 per cent elongation; sp gr, 7.6; Bhn, 150-200. For use where resistance to high temperature in sulphur gas atmosphere is required.

1 2 - 4 5 - 7 - - -
FANSTEEL—Fansteel Metallurgical Corp., North Chicago, Ill.

\- 2 - 4 - - 7 - - - -
Molybdenum; molybdenum 99.9+; in finished rods or bars, wire, sheets, strips and powder metal; for stamping, turning, boring, welding into parts. Ult ts, 260,000 psi; impact resistance, high; Bhn, 147; sp gr, 10.2; nonmagnetic; resists corrosion caused by most acids; heat-resistant to 3000 deg. F in protective atmospheres; abrasion resistance, medium. Used for critical electrical parts.

1 - - - 5 - 7 - - -
Tantalum; tantalum 99.9+; in finished rods or bars, tubing, wire, sheets and strips; for stamping, turning, boring, welding, etc. Ult ts, 42-178,000 psi; impact resistance, medium; Bhn, 75-125; sp gr, 16.6; nonmagnetic; weldability, good. For corrosion-resisting parts.

\- 2 - 4 - - 7 - - - -
Tungsten; tungsten 99.95 per cent; furnished in rough bars or billets, finished rods or bars, wire sheets, shapes, powder metal and ribbon; for forming, fabricating and powder metallurgy. Mechanical properties in untreated state: ts, 490,000 psi; impact resistance, high; Bhn, 290; sp gr, 19.3; magnetic; resists corrosion caused by most acids; abrasion resistance, high.

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FARRELL—Farrell-Cheek Steel Co., Sandusky, O.

Hard-edge; furnished as sand castings; high abrasion resistance; high-tensile strength and ductility; Bhn, heat-treated 650-700 and higher. For crane wheels, cast tooth gears, rollers, sheaves, sprockets, traction wheels, etc.

Type 85; specially processed steel castings for resisting abrasion, and possessing high strength toughness and rigidity; ts. to 150,000 psi. Used for parts subject to shock, high stress, overload, wear and abrasion.

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FEDERAL BRONZES — Federal-Mogul Corp., Detroit.

F1; a gear bronze suitable for heavily loaded piston pin bushings, etc.

F2; lead bronze for average bushings application.

F3; used largely as backs for babbitt-lined bearings.

F5; widely used for babbitt-lined bearing backs and for bushings where service is not severe.

F8; good casting and machining qualities.

F11; for piston pin bushings and other low speed, heavily loaded applications.

F15; has 20 per cent lead and may be used safely under adverse lubrication conditions.

F-16; because of high lead content may be used where only occasional lubrication is possible.

F18; high lead alloy of good casting characteristics.

F20; a hard bronze used for gears and worm wheels where requirements are severe; also aluminum - bronze and special analysis bronzes.

\- - - 4 - - - - - -
FERROWELD—Lincoln Electric Co., Cleveland. For arc-welding cast iron. Has steel base to give solid weld on cast iron of greater tensile strength than the cast iron itself. Due to low current which can be used, hardening effect usually present along the line of fusion is materially reduced.

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FINKL—A. Finkl & Sons Co., Chicago.

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Type C; chrome-nickel-molybdenum; carbon .40; furnished heat-treated to various tempers. For large section forgings or forgings of irregular section not suitable for heat-treating by liquid quenching.

Type R; chrome-nickel-molybdenum; carbon .28; furnished in forgings, heat-treated to various tempers. For hammer piston rods, crankshafts and forgings subject to shock and vibration.

\- 2 3 4 - - - - - -
FS Annealed; carbon .50, chrome, nickel and molybdenum; oil quench; for die blocks for oil hardening. Miscellaneous forgings subject to forging temperatures and/or abrasion.

\- 2 3 - - - - - - - 10
FX; carbon .55, chrome, nickel and molybdenum; furnished heat treated to various tempers, all commercially machinable. For use as drop hammer dies and blocks, forging machine dies, backing-up rolls and dipper teeth.

\- 2 3 - - - - - - -
Shell Die; chromium 4.50-5.00, high silicon and molybdenum; normalized or quenched in oil or in air blast. For shell punches, mandrels and die inserts.

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FIRTHALOY—Firth-Sterling Steel Co., McKeesport, Pa. Highly developed form of sintered carbide adapted to wire drawing dies, extrusion dies and similar purposes.

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FIRTHITE—Firth-Sterling Steel Co., McKeesport, Pa. Hard metal composition of sintered carbides furnished in a number of grades to form wearing surfaces or the edges of cutting tools.

\- - 3 4 5 - - - - -
FIVEPOINT DEEPHARD STEEL—Foote Bros. Gear & Machine Corp., Chicago. Low-carbon steel parts, regardless of SAE or NE type, manufactured by the company and hardened by its Five Point Deephard process which can be applied also to castings, forgings, bar or plate steel, and results in superior wearing qualities. Company also has special alloy steel of a nickel-moly-chrome analysis, used especially to improve cores where it is otherwise impossible to obtain core hardness over 300 brinell because of excessive bulk. Furnished complete only as gears, pinions, or machine parts.

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FLEETWELD—Lincoln Electric Co., Cleveland. Shielded arc electrode for welding mild steel.

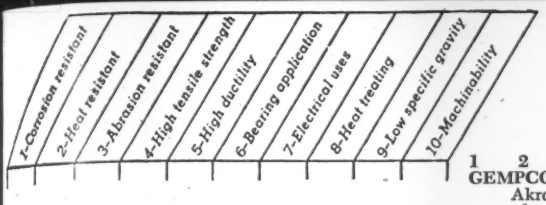
Type 5; for flat, vertical and overhead welding. Ts, 65-75,000 psi; ductility, 20 to 30 elong in 2 in.; impact resistance, 30-70 ft-lbs (Izod); density 7.84-7.86 grams per cc; corrosion resistance greater than mild steel. AWS Class E-6010.

Type 7; for general-purpose welding and where fit-up is not of the best; low spatter and slag loss, high burn-off rate. Physical properties as welded; ts, 70-80,000 psi; yield point, 55-66,000; ductility, approximately 17 per cent elong. in 2 in.; sp gr, 7.80. AWS Class E-6012.

Type 9; heavily coated electrode of shielded arc type specifically for flat welding of deep groove joints. Physical properties as welded: ts. 66-74,000 psi; yield point, 55-60 000; elong 20-30 per cent in 2 in.; sp gr, 7.85-7.86; operates either with dc or ac. AWS Class E-6020 and E-6030.

Type 9-HT; heavily coated electrode of shielded arc type for deep-groove welding in a flat position of high tensile steels. AWS Class E-7020 and E-7030.

Type 10; for downhand welding on flat surfaces for finish bead welding and to provide full slag coverage and smoothness. Can be used with either direct or alternating current normal or reverse polarity. AWS Class E-6020 and E-6030.



Type 11; heavily coated electrode of shielded arc type for downhand fillet welding with "Fleet-Fillet" technique. Physical properties similar to Type 9. AWS Class E-6020.

Type 35; for flat, vertical and overhead welding on both ac and dc. Physical properties similar to Type 5 electrode. AWS Class E-6011 and E-6010.

Type 37; for flat, vertical and overhead welding on mild steel. Especially designed for welding sheet metal. Physical properties similar to Fleetweld 7. AWS Class E-6013, E-6012, E-7011 and E-7012.

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FLYLITE—Magnesium Div., Howard Foundry Co., Chicago.

Grade No. 8; aluminum 5.3-6.7, manganese .15 min, zinc 2.5-3.5, silicon .3 max, copper .05 max, nickel .005 others .3, magnesium remainder. As cast; for castings requiring moderate strength and toughness. Heat-treated; for castings requiring high strength and maximum toughness. Heat-treated and aged. For casting requiring high yield strength, hardness, moderate toughness.

Grade No. 4; aluminum 8.3-9.7, manganese .1 min, zinc 1.7-2.3, silicon .3 max, copper .05 max, nickel .005, others .3, magnesium remainder. Characteristics similar to Flylite No. 8. Flylite No. 4 is preferred for maximum pressure tightness.

1 2 3 4 - - 7 8 - -
FRANKITE—Frank Foundries Corp., Moline, Ill.

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E-212; low-carbon electric furnace iron; pressure-resistant and long-wearing dense grain in heavy sections; for hydraulic bodies, refrigerator parts, compresser cylinders, etc. Good machinability.

1 2 - - - - - 7 - - -
E-450; nickel 14, chromium 2, copper 6, electric furnace Ni-Resist. Has corrosion resistance, heat resistance to 1500 deg. F.; fair machinability.

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E-604; nickel 4½, chromium 1½, electric furnace Ni-Hard white iron. Combats corrosion; for mixer blades, ash chutes, scrapers, grinding burs, etc.; machine by grinding.

1 2 - 4 - - - - - - -
E-830-N; chromium 30, nickel 3, low carbon; heat-resistant; for continuous oven kilns, cement kiln cooler parts, furnace supports, etc.; machinability, fair.

1 - 3 - - 6 - - - 10
FRONTIER—Frontier Bronze Corp., Niagara Falls, N. Y. Available in following grades:

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40 E; in sand castings and ingot form; not heat-treated; ts, 30-38,000 psi; yield strength, 22-26,000; elongation, 3-10 per cent; resists salt water corrosion; abrasion resistance, high; excellent machinability; resistant to hydrostatic pressure; resistance to shock and impact, high.

No. 5 aluminum bronze; in castings, ts, 60-95,000 psi; compressive, 22-65,000; ductility, good; Bhn, untreated, 130; heat-treated, 130-200. For parts where resistance to shock, fatigue and wear are essential.

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No. 11 nickel bronze; good bearing qualities with positive lubrication; wear-resistant; heat-treated, ts, 60-70,000 psi; yield strength, 38-45,000; elongation, 15-20%; Bhn, 160.

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No. 40E; furnished in rough bars or billets, and sand castings; ult ts, 32-38,000 psi; yield point 22-26,000 psi, elongation, 3-10 per cent; impact resistance, high; Bhn 60-70; nonmagnetic; sp gr, 2.81; resists corrosion caused by salt water; weldability, good; heat-resistant to 300 deg. F.

G

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G ALLOY—American Smelting & Refining Co., New York. Lead-bearing alloy furnished in ingots for spinning and mold casting. Resists heat to 300 deg. F.; abrasion resistance, high; ts, ult, 10,000 psi; compressive, 15,000; good bearing properties; Bhn, untreated, 22. Used for bearing applications. Is being widely substituted for tin babbits.

1 2 3 - - - - - - -
GEMPCO—The General Metals Powder Co., Akron, O. Metallic friction materials made of powdered copper and other powdered metallic and nonmetallic ingredients, blended, compressed to shape and heat-treated. Riveted or brazed to metal backing. Thicknesses from .012-in. up. For clutch disks, clutch and brake linings.

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GIBSILOY—Gibson Electric Co., Pittsburgh. Electrical contacts having low contact resistance, nonsticking properties, long life under arcing conditions.

A; silver-nickel; A-1 silver 95, nickel 5, to A-8 silver 60, nickel 40; in contact rivets, disks, screws and other shapes and in sheets and wire. Lowest contact resistance; highly ductile.

C; silver-graphite: C-1 silver 99, graphite 1, to C-7 silver 93, graphite 7; in contact disks and other shapes and in sheets. Best nonsticking properties.

NW; silver-nickel-tungsten; various combinations in contact disks and other shapes and in sheets. Hard, arc resisting.

See advertisement, Page 314

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GLACIER—Glacier Metal Co., Richmond, Va.

Antifriction metal; sold in ingots; recommended pouring temperature, 600 deg. F; Bhn, 24.1; load to reduce height of test piece by 0.001, 4599 psi; load required to compress test piece 50 per cent of original height, 26,118 psi; sp gr, 9.976; wt per cu in, .359.

Genuine Sovereign babbitt; yield strength, 5 tons per sq in.; elongation in 2 in., 16.7 per cent; Bhn, 28.4; load to reduce height of test piece by 0.001 in., 9800 psi; sp gr, 7.327; wt per cu in .263 lb; pouring temperature, 800 deg F. Used for bearings.

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GLOBE Tubing—Globe Steel Tubes Co., Milwaukee.

Carbon seamless tubes in low and medium carbon for mechanical purposes. Furnished hot-finished and cold-drawn to wide range of sizes; also annealed or cold-drawn stress relieved to higher physicals for strength and machinability.

Carbon seamless steel pressure tubing in low and medium carbon for boiler, condenser, heat exchanger tubes, straight and formed.

Alloy seamless steel tubing in low and medium carbon in SAE and NE grades for mechanical and aircraft tubing; in regular and magnaflux quality. Intermediate alloys such as 5 per cent to 9 per cent Chrome Moly for petroleum industry.

Stainless seamless tubing in austenitic 18-8 types. Low carbon Type 304, stabilized Types 321 and 347 for welding and maximum corrosion and heat resistance; for dairy, food, chemical industries. Types 329 and 443 for corrosion resistance in specific applications in chemical and textile fields. Straight chrome Types 410 for heat treating where high tensile and toughness with mild corrosion resistance is required. Type 430 for chemical service, especially nitric acid; also for heat resistance applications. Type 446 for high temperature service where load carrying requirements are not severe, good resistance to high sulphur atmospheres. Used where nickel bearing grades are objectionable.

See advertisement, Page 294

1 - - - - - - - - - -
GLOBEIRON—Globe Steel Tubes Co., Milwaukee. High purity ingot iron in seamless tubing providing high magnetic permeability for electrical purposes. Offers some corrosion resistance in certain special cases because it approaches pure iron.

See advertisement, Page 294

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GLOWELD—Globe Steel Tubes Co., Milwaukee, Stainless welded tubing in Types 304, 347 and 316 and special analyses for applications similar to seamless types listed elsewhere for the company. Type 316 can be used in chemical and textile fields.

See advertisement, Page 294

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GLYCO BABBITT—Joseph T. Ryerson & Son, Inc., Chicago. General tradename covering a group of specially processed lead-base alloys including:

Turbo-Glyco; for high-speed, heavy duty; avg Bhn, 30.

Marine Glyco; for electric motor and marine work; avg Bhn, 27.

Standard Glyco; free flowing, general purpose; avg Bhn, 24.

Heavy pressure mill Glyco; high resistance to crushing loads; avg Bhn, 23.

Transmission Glyco; for line shafting and transmission work; avg Bhn, 22.

See Advertisement, Page 308

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GRAMIX—United States Graphite Co., Saginaw, Mich. Porous metal bearings and mechanical shapes, made in several grades of which the following is typical:

No. 81 sintered bronze; ts, 15,000 psi; compressive force to cause .001-inch permanent set, 10,000 psi; apparent density, 6.4-6.6 grams per cu-cm; oil absorption (by volume), 20-30 per cent; coefficient of thermal expansion 70-200 deg F, .00000934 in. per in. per deg F.

No. 86 sintered iron; ts, 20,000 psi; compressive force to cause .001-inch permanent set, 16,000 psi; apparent density, 5.8-6.1 grams per cu cm; oil absorption (by volume), 15-20 per cent; coefficient of thermal expansion, 70-200 F., .0000071 in. per in. per deg F.

See advertisement, Page 251

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GRAPHALLOY — Graphite Metallizing Corp., Yonkers 3, N. Y. Carbon-graphite metallized (impregnated) with either molten babbitt, copper, cadmium or silver, depending upon its use. Furnished in finished rods or bars and tubes machined to any desired form or shape. Ts, 4000 psi; compressive, 18,400 psi; coefficient of friction, constant and low; coefficient of expansion, one-half that of steel; weight, 1¾ oz per cu in.; self-lubricated. Used where usual form of lubrication cannot be applied, at temperatures where oil solidifies or volatilizes; for current-carrying bearings, submerged bearings in water, gasoline, weak acids and dye; and thrust washers or constant friction applications. Material also has electrical applications. Used in agricultural, chemical, food, marine, printing, textile and ventilating machines.

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GRAPH-M.N.S.—Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O. Carbon 1.5; manganese, 1.25; phosphorus .025, max; sulphur .025, max; silicon 1; nickel 1.75, molybdenum .5, chromium .5; in hot-rolled bars and billets, finished rods and bars, wire, sheets, strip and plates. Has good resistance to abrasion, and nonscuffing properties when cold forming metal; ts, annealed, ult, 135,000 psi, medium ductility. Recommended heat treatment, heat to 1550-1650 deg F. depending on section; air cool. Brinell hardness, annealed 241, heat-treated 682. Used for various types of machine parts, as well as cold-working dies and tools.

1 - - - - 6 - 8 - -
GRAPH-MO—Timken Steel & Tube Div. The Timken Roller Bearing Co., Canton, O. Carbon 1.5, silicon .8, manganese .4 max, phosphorus and sulphur .025 max, molybdenum .25; in hot-rolled bars or billets, finished rods or bars, seamless tubing, wire, strips, sheets and plates. Has high abrasion resistance; ts, ult, 85,000 psi, min; medium ductility; fair bearing properties: good weldability; good nonscuffing properties; recommended heat treatments for annealing, nor, 1600 deg F; furnace cool from 1450, oil quench at 1475-1550 deg F; Bhn, annealed 197, heat-treated 745. Used for various machine parts.

1 - 3 - - 6 - - - -
GRAPHO Babbitt Metal—Lehigh-Babbitt Co., Allentown, Pa. Babbitt metal of different grades, mixed with graphite; can be poured as regular metal without losing graphite content. Mechanical properties similar to those of other babbitt metals; for bearings.

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GRAPH-SIL—Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O. Carbon 1.5, silicon .9-1, manganese .4 max, phosphorus and sulphur .025 max.; in hot-rolled bars or billets, finished rods or bars, seamless tubing, wire, sheets, strips and plates. Tensile strength ult, 97,000 psi, min; abrasion resistance, high; medium ductility; excellent machining and nonscuffing properties; good weldability; for annealing, nor, 1600 deg F; furnace cool from 1380 deg F; Bhn, 197; quench 1450-1525 deg F into water brine. For use as cylinder liners and machine parts as well as tools and dies.

- - - 4 - - - - - - -
GUNITE—Gunite Foundries Corp., Rockford, Ill. Processed high-test cast iron in ten grades, with Gunite A as standard metal described here. Mechanical properties in untreated state: ult ts, 50,000 psi; compressive, 120,000; impact resistance, medium; Bhn, 207-241; weight density, .265 lb per cu in.; heat-resistant to 1100°F; abrasion resistance, medium. Used for brake drums, hydraulic parts, crank shafts etc.

H

HANDY FLUX—Handy & Harman, New York 7. For brazing steel, stainless steel, monel metal, nickel, copper, beryllium-copper, brass, bronze, aluminum-bronze and various other ferrous and nonferrous metals and alloys. Liquid and active at 1100 deg F.

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HARDTEM—Heppenstall Co., Pittsburgh. Carbon .5, chrome-molybdenum-vanadium die steel; for die blocks, shafting, etc.

- - 3 4 5 - - - - - -
HARDWELD—Lincoln Electric Co., Cleveland. High-carbon arc welding electrode having Bhn of 225-488. Provides dense, tough surface of moderate hardness to enable various steel parts to resist shock and abrasion; for locomotive or crane tire flanges, etc.

Type 50; medium-carbon steel electrode for building up steel parts and surfaces. Deposit has considerable resistance to deformation and wear, and is machinable at slow speed. Coating stabilizes the arc and permits deposition of a tough, dense medium carbon steel. Hardness, deposited on straight-carbon steel and allowed to cool naturally, 20 to 35 Rockwell C.

1 2 3 - - - - - - - -
HARDY Metal Powders—Charles Hardy Inc., New York 17. Metal powders of various kinds including aluminum, brass, copper, iron, tungsten, manganese, nickel, etc.; available commercially; when compressed into parts give most physical characteristics which are available from metal or alloys produced by melting and casting. According to metal powders chosen and method of processing, variations in all of the properties can be obtained.

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HARRIS 80-10-10—Arthur Harris & Co., Chicago 7. Copper 80, tin 10, and lead 10; furnished as sand castings. Used for bearings and pressure castings.

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HASCROME—Haynes Stellite Co., Kokomo, Ind. Chromium-manganese-iron composition welding rod for hard-facing parts subject to abrasion and impact, and castings to resist abrasion and impact.

See advertisement, Page 297

1 2 - 4 - - - - - -
HASTELLOY—Haynes Stellite Co., Kokomo, Ind. Corrosion-resistant, nickel-base alloys for piping, tanks, pump parts, valves, vessels.

A and B; nickel, molybdenum and iron; for resistance to hydrochloric acid.

C; nickel, molybdenum, chromium, tungsten and iron; for resistance to wet chlorine, and oxidizing or reducing acid solutions.

D; nickel, copper and silicon; for resistance to sulphuric acid, hot or cold.

See advertisement, Page 297

1 2 3 - - - - - - -
HAYNES STELLITE—Haynes Stellite Co., Kokomo, Ind.

1 2 3 - - - - - - -
Non-ferrous cobalt-chromium tungsten alloys; for corrosion and wear-resistant castings; hard-facing welding-rod for parts subject to abrasion or a combination of abrasion, heat and corrosion. Metal-cutting tools of non-ferrous cobalt-chromium-tungsten alloy, as solid, square and rectangular bits, welded-tip tools and special tools.

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Type 93; ferrous alloy welding-rod for hard-facing metal wearing parts; abrasion resistance, high; ts, ult, 43,040 psi average; Rockwell hardness, untreated C-62; heat treated, average C-67.

See advertisement, Page 297

- - 3 - - - - - - -
HAYSTELLITE—Haynes Stellite Co., Kokomo, Ind. Cast tungsten carbide; inserts, tube rod, and composite rod (welding) for hard-facing oil-well drilling tools, dredge cutter blades, etc.

See advertisement, Page 297

- 2 3 4 5 - - - - - -
HEPPENSTALL—Heppenstall Co., Pittsburgh.

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2 C 30; nickel-chrome-molybdenum steel; carbon .3. For shafting where high torsional strength is required such as drop hammer piston rods.

- 2 3 4 - - - - - - -
5 H 50; carbon .5, chrome-molybdenum and vanadium alloy; furnished as die blocks. Material is heat-resistant, abrasion-resistant; has high tensile strength and high ductility. Used for strip mill rolls, etc.

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HERCULOY—Revere Copper and Brass Inc., New York 17.

419 and 421; silicon 1.5-2.25, either .25 tin or .35 manganese, balance copper; in rods or bars, tubing, wire sheets, strips (coiled) and plates; for hot forging, stamping, extruding, welding, deep drawing and cold forging. Corrosion-resistant; medium abrasion resistant; ts, ult, 45-90,000 psi; high ductility. For cold-headed bolts, nuts, screws, nails and electrical hardware.

418 and 420; silicon 3, either .5 tin or 1 manganese, balance copper; same as above; ts, ult, 55-120,000 psi, high ductility. Used for range boilers, and for applications requiring high strength in combination with good weldability and corrosion resistance.

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HI-GLOSS—Jessop Steel Co., Washington, Pa. Type 304; stainless steel having ult strength of 90,000 psi; yield point, 45,000; elongation in 2 in., 60 per cent; weight per cu in., .238 lb; Bhn., 150. Used for pumps, airplanes, air conditioning, automotive, chemical, dairy, restaurant, etc.

1 - - - - - - - - 9 -
HILLS-McCANNA—Hills-McCanna Co., Chicago. Magnesium alloy sand castings; light in weight; have high strength; and are used for aircraft parts, etc.

See advertisement, Page 143

1 - - - - - 7 - - -
HIPERNIK—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. A magnetic alloy consisting of 49.5 per cent nickel and 49.5 iron; manganese .1; extremely ductile. Developed for special magnetic properties at moderately low induction, primarily for radio applications. Also used for transformer laminations; melting point is 1450 deg C. For relays, radio and current transformers and instrument parts.

1 - - 4 - - - - - 10
HITEST—The Medart Co., St. Louis. Cast iron for ordinary cast-iron uses and for cast steel in some applications. Material is corrosion-resistant; has high tensile strength; and good machinability.

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HOYT BABBITT METAL—National Lead Co., New York 6. Analysis of material varies according to the bearing application.

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HY-SPEED—Buckeye Brass & Mfg. Co., Cleveland. Copper 88, tin 10, lead 2. For bushings, bearings, bars.

See advertisement, Page 153

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HYTEMCO—Driver-Harris Co., Harrison, N. J. Alloy of nickel and iron characterized chiefly by its high temperature coefficient of electrical resistance. Lends itself advantageously to uses requiring self regulation by temperature such as immersion heaters.

- - 3 4 5 - - 8 - -
HY-TEN—Wheelock-Lovejoy & Co. Inc., Cambridge, Mass. Chrome-manganese-molybdenum and chrome-nickel-molybdenum alloys with carbon from .10-1; machinability, good; for machine parts.

1 - - 4 5 6 - - - -
HY-TEN-SL-Bronze—American Manganese Bronze Co., Philadelphia 36. Available in five grades as rough bars or billets, finished rods or bars and castings, as follows:

1 - - 4 - 6 - - - -
No. 1; copper 60-68, zinc 20-24, aluminum 3-7, manganese 2.5-5, and iron 2-4. In untreated state, ult ts, 10,800 psi min; compressive yield point, 58,000 psi min; yield point, 65,000 psi; elongation in 2 in, 14 per cent; impact resistance, medium; Bhn, 220; sp gr, 7.74 (wt per cu in. = 0.280 lb); practically nonmagnetic; weldability, fair; heat resistant to 500 deg F; abrasion resistance, medium; pressure resistance, good. Used for lifting nuts, housing nuts, worm wheels (slow speed), spur and bevel gears, hydraulic valves, seats and stems.

No. 1A; copper 60-68, zinc 20-24, aluminum 3-7, manganese 2.5-5, iron 2-4. Mechanical properties in untreated state are: ult ts, 11,500 psi min; compressive yield point, 65,000 psi min; yield point, 75,000 min; elongation in 2 in., 12 per cent; impact resistance, medium; Bhn, 240 min; sp gr, 7.74 (wt per cu in. = 0.280 lb); practically nonmagnetic; weldability, fair; resists corrosion caused by water, air, etc; heat resistant to 500 deg F; abrasion resistance, medium. For same applications as No. 1.

No. 2; (sand cast), ult ts, 100,000 psi; yield point, 55,000 psi; elongation in 2 in., 15 per cent; compression yield point, 50,000 psi; sp gr, 7.80.

1 - - 4 5 - - - - -
No. 3; copper 60-68, zinc 20-24, aluminum 3-7, manganese 2.5-5, iron 2-4. In untreated state, ult ts, 90,000 psi min; compressive yield point, 40,000 psi min; yield point, 45,000 psi min; elongation in 2 in., 20 per cent min; impact resistance, medium; Bhn, 175; sp gr, 7.88 (wt per cu in. = 0.285 lb); practically nonmagnetic; weldability, fair; resists corrosion caused by air, water, etc; heat resistant to 500 deg F; abrasion resistance, medium; good pressure resistance. For applications same as Nos. 1 and 1A.

No. 4; (sand cast), ult ts, 85,000 psi; yield point, 40,000 psi; elongation in 2 in., 25 per cent; compression yield point, 35,000 psi.

See advertisement, Page 307

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IDEALOY—Wellman Bronze & Aluminum Co., Cleveland. Copper-tin-zinc alloy for heavy-duty bearings.

See advertisement, Page 164

1 2 3 4 - - - - - 10
ILLIUM—Burgess Parr Co., Freeport, Ill.

1 2 - - - - - - - 10
G; nickel 54-58, chromium 20-24, copper 5-7, molybdenum 5-7, iron 5-7, manganese .75-1.5, silicon .65, max, carbon .2 max. Available in cast rough bars or billets, cast tubing, cast plates and miscellaneous sand castings to specification. Other methods of fabrication include machining and welding. Bhn, 160-210; ts, 60-73,000 psi. For pumps, meters, chemical equipment and other parts subject to corrosion. Resists most corrosive solutions in a wide range of temperatures and concentrations including the halogens in dry state and their salts and acids in low concentrations at ordinary temperatures. Resists heat to 1900 deg F.

1 2 - - - - - - - 10
INCONEL—The International Nickel Co. Inc., New York. Nickel 79.5, chromium 13, iron 6.5, manganese .25, silicon .25, carbon .08, chromium 13, sulphur .015; corrosion resistant, high mechanical properties, resistant to heat to 2000 deg F. Used for high temperature applications and equipment for handling food and chemical products.

See advertisements, Pages 163, 250

1 - 3 - - 6 - - - -
INDIUM—The Indium Corp. of America, New York. A very soft metal used electrolytically or as a constituent of nonferrous alloys; commercial grade 99.9+ per cent pure, furnished in finished rods, bars, foil or powder; recommended heat treatment, diffusion for 2 hours at 350 deg F; sp gr, 7.31; resists corrosion caused by salt spray and acids in oil; abrasion resistance, high. Used for bearing surfaces, protective coating for moving parts subject to wear and corrosion etc.

See advertisement, Page 312

1-Corrosion resistant | 2-Heat resistant | 3-Abrasion resistant | 4-High tensile strength | 5-High ductility | 6-Bearing application | 7-Electrical uses | 8-Heat treating | 9-Low specific gravity | 10-Machinability

1 2 - 4 - - - - - - -
INGACLAD—Ingersoll Steel & Disc Div., Borg-Warner Corp., Chicago.
Stainless clad steel consisting of a layer of 18-8 chrome-nickel, Type 304, also 18.8 columbium stabilized and 18-8 molybdenum bearing, stainless layer bonded to a layer of ordinary steel. Uses include equipment for chemical, food, dairy, processing, brewery, packing house, bottling industries, etc.; suitable for applications requiring stainless steel protection on one surface.

1 2 - - 5 - - - - - -
INGERSOLL—Ingersoll Steel & Disc. Div., Borg-Warner Corp., Chicago. Stainless steel in sheets for stamping and welding into parts; resists heat up to 1200 deg F; abrasion resistance, medium; ts, ult 85,000 psi; ductility, high; Bhn, annealed, 165.

1 2 - 4 5 - 7 - - 10
INTERNATIONAL NICKEL — International Nickel Co. Inc., New York.
Nickel: nickel 99.4, copper .1, iron .15, manganese 2, silicon .05, carbon 1, sulphur .005; rustproof, corrosion-resistant chemical parts.

- 2 - - 5 - - - - - 10
L Nickel; a low carbon type of nickel, otherwise similar in chemical composition to nickel. Especially suitable in contact with fused caustic and certain fused salts; corrosion and heat-resistant.

- - - 4 5 - - - - - 10
D Nickel; nickel 95.2, copper .05, iron .15, manganese 4.5, silicon .05, carbon .1, sulphur .005. A metal similar to nickel but affording superior mechanical properties and resistance to atmospheric attack at elevated temperatures; corrosion and heat-resistant; for electrical uses.

- - - 4 5 - - 8 - -
Z Nickel; nickel 98; heat-treatable material resembling nickel except for its higher mechanical properties which are comparable to those of oil-tempered spring steel; corrosion resistant; used for products requiring spring properties with corrosion resistance.

See advertisements, Pages 163, 250

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INVAR—Carpenter Steel Co., Reading, Pa. Low expansion alloys, iron-nickel alloys, furnished in finished rods, bars, and strip. Various types available to meet expansion rates between different temperature ranges. Free-machining grade for automatic screw machine parts. Analyses for two types are:
Type 36; carbon .12 max, manganese .35, silicon .20 max, and nickel + cobalt 36.
Type 36 Free-cut; carbon .12 max, manganese .35 silicon .20 max, nickel + cobalt 36, and selenium .20.

See advertisements, Pages 286, 287

- 2 3 - - - - - - - 10
IRALITE—Mackintosh-Hemphill Co., Pittsburgh. Carbon 2.8-3.5, plain and alloyed cast iron; nickel, molybdenum and chromium as required. Furnished as castings; ult ts, 40-75,000 psi; Bhn, 175-400; magnetic; resists corrosion caused by acids; heat-resistant to 1500 deg. F; abrasion resistance, high. For lathe and engine beds, etc.

J, K

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JSB—Johnson Bronze Co., New Castle, Pa. Bronze on steel in finished bearings; medium abrasion resistance; bearing properties, good. Used for bushings, bearings, washers, etc. Also babbitt on steel and babbitt on bronze bearings, bronze bearings and bushings, bronze castings.

See advertisement, Page 247

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JALCASE—Jones & Laughlin Steel Corp., Pittsburgh.

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Low-carbon open-hearth steel which offers machinability practically equivalent to Bessemer screw stock plus the added advantage of rapid case carburizing properties; manufactured as AISI C-1117 and C-1118 (SAE 1117 and 1118), carbon .14-.20.

- - - - - 5 - - 8 - -
Open-hearth steel which in the higher carbon range offers exceptional heat treating qualities combined with forging properties and good machinability; manufactured as AISI C-1132 (SAE 1132), carbon 27-34; AISI C-1137 (SAE 1137), carbon .32-.39; AISI C-1141 (SAE 1141), carbon .37-.45.

- - 3 4 - - - - - 10
JEFALOY—The Jeffrey Mfg. Co., Columbus, O.

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55M; total carbon 2.85-3.05, manganese .50-.70, silicon varying, molybdenum .70-.80; furnished as castings; ts, 50-60,000 psi; compressive, 171-174 000 psi; Bhn. 248-269. For wear-resistant, high-strength parts.

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A Series; total carbon 2.85-3.50, manganese .30-.70, silicon varying; furnished as castings; ts, 35-50,000 psi; compressive, 126-170 000 psi; Bhn 192-248. For pump parts, gears, sprockets, frames, housings, etc.

1 - 3 4 5 - 7 8 - -
JESSOP—Jessop Steel Co., Washington, Pa.

- - - 4 - - 7 8 - -
Nonmagnetic steel; in rough bars or billets, finished rods or bars; sheets and plates. Medium abrasion resistance; ts. 80-110 000 psi; medium ductility; sp gr. 8.02; fair bearing properties; good weldability; Bhn., untreated 180; annealed, 150. Used for transformer covers, controller covers, switch covers, spacing bars, end fingers, etc.

1 - - 4 - - - - - -
Heat-resisting steels, in No. 4, 5 and 5-B grades; No. 4 has ult strength 95,000 psi; yield point, 50,000 psi. Used for castings, marine, submarine and torpedo parts, oil engine valves, pump shafts, etc. No. 5 has ult strength of 100 000 psi; yield point, 45,400. Used for pump parts, etc. No. 5-B applications are similar to No 5, but No. 5-B has superior resistance to corrosion, and is more easy to fabricate. No. 5-B is similar in physical properties to No. 5 except that its tensile strength is greater.

1 - 3 - 5 - - - - - -
Stainless-clad steel in any desired analysis and all degrees of cladding. Used for heads, tank wells, lids and any other part where corrosion resistance is important.

1 - - - - 6 - - - -
JOHNSON—Johnson Bronze Co., New Castle, Pa.
No. 27; copper 80, tin 10, lead 10; deoxidized with phosphorus; general-purpose bearing bronze.
No. 19; copper 70, tin 11, lead 19; high wear rating and resistance to pounding for mill bearings, gas and diesel engines, excavating and pulverizing machinery, etc.
No. 25 (plastic bronze); copper 75, tin 5, lead 19, nickel 1. For high speed with light to medium loads and generally free from shock. Because it has good acid resistance it is particularly suitable for pump bearings and sleeves, and also for electric motor, conveyor and fan, and woodworking machinery bearings.
No. 29; copper 78, tin 7, lead 15. For use where spindle is of soft steel and speed is relatively high; acid-resisting alloy.
No. 53; copper 88, tin 10, zinc 2. For severe service or heavy pressures. Should be used where shaft is hardened steel and well lubricated.
No. 72; copper 83, tin 7, lead 7, zinc 3. Best suited for moderate speeds and low loads.
No. 10 (babbitt alloy); tin 90, antimony 5, copper 5. For thin linings and in die castings.
No. 11; tin 87, antimony 7, copper 6. Rather hard babbitt recommended as lining for connecting rods and shaft bearings subjected to heavy pressures.
No. 12; tin 90, antimony 7.5, copper 2.5. For high speeds and high temperatures.
No. LX; lead 74.75, antimony 15, tin 10, copper .25. For camshaft bearings.

See advertisement, Page 247

1 2 - 4 - - - - - -
K-42-B—Westinghouse Electric & Mfg. Co., East Pittsburgh. Nickel 46, cobalt 20, iron 12, chromium 18.75, titanium 2.25 furnished in rough bars or billets, rods or bars, wire, strips (coiled), and plates; for hot forging, stamping, turning, boring, welding, etc., also as sand castings; resists corrosion caused by atmosphere and salt solutions; resists heat to 1200 deg C; ts, ult, 127,100 psi; nonmagnetic; Bhn, heat-treated 280. For applications where high strength at high temperatures is required.

1 2 3 - - - - - - -
KENNAMETAL—Kennametal Inc., Latrobe, Pa.
Type KM; cobalt 11, tungsten-titanium carbide (W Ti C_2); tungsten carbide WC; columbium carbide constituting balance; for wear parts, etc. Resists heat to 1200 deg F; high abrasive resistance; compressive strength about 650 000 psi; transverse rupture strength, 305 000 psi; hardness, 90.8 Rockwell A (77.6 Rockwell C), thermal conductivity, .113 cal/sec/ degrees Cent./cm; volume electrical conductivity, 4.7 per cent of annealed copper standard; thermal expansion about 6 × 10^{-6} deg Cent.; sp gr, 11.8, Young's modulus about 74,000,000.
Type K2S; cobalt, W Ti C_2; WC. Used for machining cast steel; Rockwell A, 91.5; trans. rupture, 325 psi; Young's modulus, 79,800,000 psi.
Type K6; cobalt 4, tungsten carbide 96. Used for machining cast iron and nonferrous metals; Rockwell A, 92.2; trans. rupture, 22 000 psi; Young's modulus, 90,300,000 psi.
Type K10; cobalt tungsten-carbide. Rockwell A, 91.0; trans. rupture, high; Young's modulus, 84,000,000 psi.
Type K12; cobalt tungsten-carbide. Rockwell A, 89.2; trans. rupture, very high; sp gr, 14.19.
Type KWS and Special; heat-resistant. According to requirements; will resist oxidation to 1600 F; Rockwell A, 84-90. Strengths lower than in tool grades. For orifices operating at high temperatures.
Type K3H; similar in composition to other types but harder. Compressive strength, 675 000 psi; transverse rupture strength, 260 000 psi; hardness, 91.8 Rockwell A, (79.6 C); thermal conductivity, .068 cal/sec/ degrees Cent./cm; volume electrical conductivity, 3.3 per cent of copper; thermal expansion about 5.5 × 10^{-6}/deg Cent; sp gr, 11.0; Young's Modulus, 72,100 000.
Type K4H; cobalt 7 per cent, tungsten-titanium carbide (W Ti C_2), and other ingredients. The hardest type of Kennametal. Has higher thermal conductivity than others. Used for precision boring of steel, machining steel, semisteel, brass, bronze, aluminum, etc. Compressive strength about 680 000 psi; transverse rupture strength, 225,000 psi; hardness, 92.3 Rockwell A (80 6 C); thermal conductivity, .12 cal/sec/deg Cent./cm; volume electrical conductivity 5.3 per cent of copper; thermal expansion about 5.5 × 10^{-6}/deg Cent; sp gr, 12.45; Young's Modulus 79,600,000.

See advertisement, Page 259

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KLEENKUT—Heppenstall Co., Pittsburgh. Tool steel containing 2 carbon and 12 per cent chromium. For shear knives for cold shearing light material.

1 2 - - - - 7 - - -
KOVAR—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Low expansion to 400 deg C; approximately 28 nickel, 17 cobalt, balance iron. For gastight metal-to-glass seals on radio tubes, instrument parts, electronic tubes and all other glass-to-metal seals. Distributed by Stupakoff Laboratories, Pittsburgh.

L

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LEDALOYL—Johnson Bronze Co., New Castle, Pa. Self-lubricating bearing bronze, pre-alloyed; contains lead which eliminates harshness and provides conformability for misalignment. Combination of lead and graphite plus oil content make it useful where lubrication is remote or likely to be entirely forgotten.

See advertisement, Page 247

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LIGHTWELD—Lincoln Electric Co., Cleveland. Arc-welding electrode made for fabrication of chain and gear guards and other machine parts of light gage steel.

1 - - 4 5 - - - - -
LMC—Lewin-Mathes Co., St. Louis 2. Pure electrolytic copper, brass and bronze mixtures, Cupro Nickel; available in tubing. Used for all copper and brass tubing purposes.

1-Corrosion resistant | 2-Heat resistant | 3-Abrasion resistant | 4-High tensile strength | 5-High ductility | 6-Bearing application | 7-Electrical uses | 8-Heat treating | 9-Low specific gravity | 10-Machinability

- - - - - - - - - -

LO CRO—Crucible Steel Co. of America, New York.

Type 501; stainless steel containing over .1 carbon, and 4-6 chrome.

Type 502; stainless steel containing .1 max. carbon, and 4-6 chrome.

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LOTUS BABBITT—Lumen Bearing Co., Buffalo 12. Lead base bearing babbitt.

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LUBRICO—Buckeye Brass & Mfg. Co., Cleveland. Copper 75, lead 20, tin 5 per cent. For bearings, bushings and bars.

See advertisement, Page 143

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LUBRIK—Pittsburgh Brass Mfg. Co., Pittsburgh 1. Copper 85, tin 10, phosphorus 2½, and zinc 2½; furnished in rough bars or billets for turning, boring, etc; Bhn, 69. For heavy-duty bronze bearings.

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LUKENS—Lukens Steel Co., Coatesville, Pa.

2 per cent nickel steel; in plates and spun and pressed heads; for hot forging, stamping, welding, riveting, turning, boring, etc., into many types of machine parts where a high-tensile steel of good ductility is required.

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Carbon-molybdenum steel; in plates and spun and pressed heads for hot forging, stamping, welding, riveting, turning, boring, etc. For machine parts requiring a high-strength steel which retains its strength under conditions of elevated temperature operation.

- - 3 4 - - - - - -

Abrasion-resisting steel; furnished same as above. For use in a variety of parts requiring resistance to wear or abrasion.

- - 3 - 5 - - - - -

Gear rim steel; furnished same as above; abrasion and wear-resisting. Originally developed for use in rims of welded gear blanks, as well as other machine parts.

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Chrome-manganese steel; furnished same as above; ts, 100,000 psi. Used principally in fan blades and fan rings.

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3½ per cent nickel steel; furnished same as above; ts, 70,000 psi. Used where good resistance to impact is desired in parts operating in sub-zero temperatures.

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Manganese-vanadium steel; furnished in same as foregoing; high-tensile steel with good welding properties. Used in construction of antiaircraft gun mounts and carriages as well as military tank parts.

- - - 4 5 - - - - -

Manganese steel—titanium treated; furnished in same as foregoing. High tensile steel with good welding properties. Used in military and naval construction.

- - 3 4 - - - - - -

Manganese-molybdenum steel; furnished same as foregoing; ts, 95,000 psi. For use in parts in which abrasion and high tensile strength is desirable.

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Nickel-clad, Super nickel-clad, Inconel-clad and Monel-clad steels are all clad metals or bi-metals consisting of light layer of corrosion-resistant super-nickel, nickel, Inconel or Monel bonded to a heavier base plate of steel. All are corrosion resistant and used in variety of machine parts where this property is desirable.

1 2 - 4 5 6 7 8 9 -

LUMEN ALLOYS—Lumen Bearing Co., Buffalo 12. (Note: "Lumen Alloy," together with each of the following numbers and grades, is a copyrighted term which should be used in specifying these materials. Thus, "Lumen Ally No. OOA," etc.)

- - - - - 6 - - - -

Nos. 00A and 00C; high tin bronzes for high compression bearing applications.

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No. 1; zinc bronze for pressure castings including spur and bevel gears.

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No. 2; zinc bronze for machine parts, bearings, etc.

1 - - - - - 6 - - - -

No. 3; zinc bronze for mine service and paper mill machinery and bearings.

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No. 4; phosphor bronze (leaded), for bearings.

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No. 4 chill cast; for heavy-duty bearings, etc.

No. 4A; high-phosphorus bronze (leaded), for bearings on hard steel.

- - - 4 - - - - - -

No. 5; general service casting alloy; red brass; for low pressure valve bodies, etc.

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No. 7; phosphor bronze; uses include trolley wheels and castings to be nickel or chromium plated.

- - - 4 5 - 7 - - -

No. 9; manganese bronze for machine parts requiring strength, electrical conductivity, and high pressure.

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No. 11-C; (sand cast) aluminum bronze; for miter, bevel gears and bearings subject to impact.

1 2 - 4 - - - - - -

No. 11-C; (heat treated) tensile strength 65-100,000 lb per sq in.; recommended where strength, corrosion and heat resistance are required.

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No. 14; zinc bronze, babbitt backing; for valve bodies, etc.

1 - - - - 6 - - - -

No. 15; phosphor bronze; for worm wheels, bearings, etc.

No. 15 chill cast; for worm gears, nuts and bearings.

- - - - - 6 - - - -

No. 15A; phosphor bronze (slightly leaded); for worm wheels, bearings, etc.

No. 15A; chill cast; for heavy-duty bearings and worm gear castings.

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No. 20; super-manganese bronze; for machine parts requiring extra strength.

1 - - 4 - - - 8 - -

No. 27; (sand cast) aluminum bronze; for strength and corrosion resistance.

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No. 27; (heat treated) for extreme tensile strength and shock resistance.

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No. 31; for high-speed, low-duty bearings.

No. 33; for bearings, high-speed, low-duty.

- - 3 - - 6 - - - -

No. 43; nickel-tin-bronze alloy for bearings, gears and nuts; abrasion-resistant.

No. 43 (chilled); nickel tin bronze for bearings, worm gears and nuts with higher tensile strength than No. 43.

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No. 48; nickel-phosphor-bronze; for bearings used with hardened steel, worm wheels, etc.

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No. 48 chill cast; for bearings, worm gears, nuts, slippers, etc.

No. 54; phosphor bronze (leaded) for bearings and worm wheels for intermediate service.

No. 54 chill cast; for bearings, worm gears, nuts etc.

1 - - 4 - - - - - -

No. 96; aluminum bronze, approximately 88 per cent copper, 8.5 aluminum and 3.5 iron; ult, ts, 73,000 psi; yield point, 25,000 psi; Bhn, 114-121; sp gr, 7.7; and has medium abrasion resistance.

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Old Genuine Babbitt; high-strength ingot babbitt for bearings.

Cosmos Babbitt; ingot materials for bearings.

Bronze; a zinc base alloy for bearings.

M

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M-13—Precision Castings Co. Inc., Syracuse, N. Y. Aluminum 9, manganese .13, zinc .6, silicon .5 max, with magnesium base; die castings; ult. tensile strength, 33,000-34,000 lb per sq in.; yield point 21,000 lb per sq in.; elongation, 2 to 5 (3 av.) per cent in 1 or 2 inches; impact resistance, low; brinell hardness, 60; specific gravity, 1.81; nonmagnetic; corrosion resistance, fair; heat-resistant to 700 degrees Fahr.; abrasion resistance, medium.

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MACHEMPITE—Mackintosh-Hemphill Co., Pittsburgh. Carbon .3-1.25, manganese 1.25-1.75, molybdenum .25-.75; castings; ult ts, 85-125,000 psi; yield point 65,000-100,000 psi; elongation, 25-5 per cent; impact resistance, low; Bhn, 215-400; magnetic; weldability, good; abrasion resistance, medium. For gears, pinions, cams, rams, etc.

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MACHINEBRONZE—Lumen Bearings Co., Buffalo 12. Zinc bronze; cored and solid bars for bearings.

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MAGNOLIA—Magnolia Metal Co., Elizabeth, N. J.

Antifriction metal; lead-tin-antimony plus special fluxes, furnished in ingots; ts, ult, 15,000 psi; compressive, 20,650; bearing properties, good; Bhn, untreated 21.8. Used for bearings.

Isotropic die cast bronze bar stock; copper 80, tin 10, lead 10, and other alloys to suit conditions. Furnished in semifinished cored and solid bars, fully machined. Resists corrosion caused by acids; resists heat to 900 deg F; ts, ult, 31,500 psi; compressive 26,000; bearing properties, good; Bhn, untreated 70. Used for bearings.

AA Bronze; Isotropic die-cast bar stock for extremely tough bearing installations and for gears. Bhn, 80; ult ts, 34,000 psi; elongation in 2 in., 8 per cent. Furnished in cored and solid bars, fully machined.

- 2 - - - - - - - -

MAGNOLIA Power Nickel-Genuine Babbit—Magnolia Metal Co., Elizabeth 4, N. J. Approximately 85 per cent tin, nickel-treated, free of lead; Bhn 27. Designed to withstand heavy, sustained loads and high heat conditions. It is alloyed for strength and hardness, and will not squeeze out under heavy pressures.

1 - - - - - - - - -

MAKEPEACE Laminated Precious Metals—D. E. Makepeace Co., Attleboro, Mass. Laminated precious metals, consisting of any precious metals bonded to any nonferrous base metals, in strips (coiled), tubing, wire and sheets; for stamping, turning, boring, etc.

Sheet; available in any combination of metals and in ratio, single or double plate or striped. Can be produced as thin as .003-in.; in widths from ⅛-in. to 6 in. wide; and within tolerances of .0001-in. to .0002 in., depending on material. Available with fine mirrored finish suitable for fine precision parts or decorative pieces. Supplied coiled or flat, depending upon requirements, for any type of part.

Tubing; deep-drawn sheet; dimensional limits lie between approx. .015-in. OD to 2 in. OD, with wall thickness as small as .005-in., very close tolerances on wall thickness and diameters. Used in electrical industry, for electronic applications, radio parts, delicate instrument assemblies, chemical industries, etc.

Special shapes also available (rectangular, octagonal, or star-shaped, etc.) Rings, sleeves and jackets can be cut from laminated tubes.

Wire; diameters, .005-in. to .006 in., depending on material; shaped for use. Available in any shape for instruments, for formed plated springs, radio electronic parts, and in chemical apparatus when corrosion must be prevented.

- 2 3 - - - - - - -

MALLIX—National Malleable & Steel Castings Co., Cleveland. Pearlitic malleable iron; for grate bars for sintering machines, elevator buckets, screen plates for pan mills and other castings subjected to heat, abrasion and shock.

- 2 - 4 - 6 7 - - -

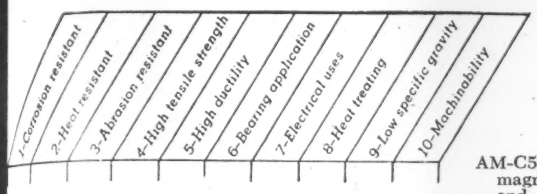
MALLORY—P. R. Mallory & Co. Inc., Indianapolis.

- 2 - - - 6 7 - - -

3 Metal; a copper-chromium-lithium alloy; used extensively for spot, flash and seam welding cold-rolled steel, stainless steel, nickel alloys and Monel metal, silicon bronze alloys, zinc, nickel, silver and other materials employed in applications where a high-strength, high-conductivity material is required; available in rods, bars, strips and castings.

- 2 - 4 - - 7 - - -

53B Metal; copper base alloy furnished in castings and forgings only; ts, 60-70,000 psi.



Used for heavy-duty butt seam welding wheels, flash welding dies, bearings and current and heat-carrying members in electrical and other machinery.

73 Metal; rough and finished bars, sheets, castings and forgings; containing 95 per cent copper; resists sea water; ts, 110-170,-000 psi. Used for bearings and bushings, vibrator arms, springs, spring washers and electrodes for projection welding.

100 Metal; rough and finished bars, castings and forgings, containing 95 per cent copper. Recommended for high loaded small gears, current-carrying bearings, springs and other details.

1000 Metal; predominantly tungsten; furnished in finished parts or blanks; ult ts, 100,000 psi; impact resistance, medium; hardness 32-40 Rockwell C; sp gr, 16.9-17.1; nonmagnetic. Heat resistant up to 300 deg Cent; abrasion resistance, high. For small counter weights, gyroscope rings, etc.

1 2 3 - - - - - - - -
MANGANWELD—Lincoln Electric Co., Cleveland. Arc welding electrode that produces deposit of austenitic manganese-nickel-molybdenum steel. Suitable for hard facing austenitic manganese steel parts containing 11-14 per cent manganese, such as crusher parts, valves, turbine runners, pulverizer roll shafts, gathering and loading equipment.

- - - 4 5 - - - - -
MAX-EL—Crucible Steel Co. of America, New York.

1-B; carbon .20, with high manganese and low molybdenum; excellent machining and uniformity in carburizing response. Used for automobile parts, machine tool parts, gages, sprockets, etc.

2-B; carbon .35-.45, and otherwise identical in analysis to 1-B. Used in "as rolled" condition for machine tool spindles, lead screws, racks, worms, piston rods, etc.

3½; for heat-treated parts on machine tools, such as gears, arbors, spindles, etc.

1 - 3 4 - - - - - - -
MAYARI—Bethlehem Steel Co., Bethlehem, Pa.

A; a nickel-chromium series of steels, corresponding to SAE 31XX series, suitable for heat-treated parts. Furnished in various carbon ranges for carburizing, water and oil-hardened parts.

B; a nickel-chromium steel furnished as bolts and sucker rods, having good atmospheric corrosion resistance combined with moderate strength; used in heat-treated condition.

R; a low-carbon, high-strength nickel-chromium-copper-phosphorus structural steel having good resistance to atmospheric corrosion. Used for structural purposes where weight reduction and corrosion resistance are desired.

1 - - 4 - - - - - 9 10
MAZLO Magnesium Alloys—American Magnesium Corp., Cleveland. Available in sand, permanent mold and die castings, rolled sheet, extruded bar, shapes and structural sections, and forgings.

AM260; aluminum 9, zinc 1, manganese .2, magnesium remainder. Heat-treatable alloy for sand and permanent mold castings. For moving parts on high-speed production equipment and wherever pressure tightness and good strength are needed. Improved salt water resistance.

AM265; aluminum 6, zinc 3, manganese .2, magnesium remainder. Used for high-strength sand castings with good chemical stability.

AM230; aluminum 10, silicon .7, manganese .2, magnesium remainder. Used for pressure die castings for parts requiring light weight and thin sections.

AM268; aluminum 9, zinc .6, manganese .2, magnesium remainder. Used for pressure die castings for lightweight parts in portable or fast-moving equipment.

AM-C57S; aluminum 6, zinc 1, manganese .15, magnesium remainder. Used for extruded bars, tubes and rolled sheet for lightweight applications in general.

AM3S; manganese 1.5, magnesium remainder. Used for sheet, strip, extruded shapes, sand castings, and hammer forgings of moderate strength for uses requiring maximum salt water resistance. Suitable for fabricated articles such as aircraft oil tanks and cowlings.

AM-C52S; aluminum 3, zinc 1, manganese .2, magnesium remainder. Used for rolled sheet and extrusions of light weight. Good welding and forming characteristics and salt water resistance.

AM-C58S; aluminum 8, zinc .8, manganese .15, magnesium remainder. Used for hot press forgings for parts under stress especially for aircraft and aircraft engines.

AM59S; aluminum 10, manganese .15, magnesium remainder. Used for extruded shapes in which highest possible hardness and yield strength in tension is required.

AM65S, aluminum 3.5, tin 5, manganese .5, magnesium remainder. Used for hot press forgings of moderate strength and lightness.

See advertisement, Page 159

- 2 3 4 - - - - - - -
MCA—Molybdenum Corp. of America, Pittsburgh. Ferro-Boron; alloying material in irons and steels. In castings use has been greatly augmented, giving increased strength and machinability, and in the case of malleable iron, ease of annealing.

Molybdenum; alloying element for use in steel and iron; imparts strength, toughness, ductility and resistance to abrasion; improves fatigue value, eliminates temper embrittlement, increases physical properties at elevated temperatures; molybdenum steel is easily welded and machined.

See advertisement, Page 154

1 - 3 4 5 - - - - 10
MCGILL—McGill Mfg. Co., Valparaiso, Ind.

1 - - 4 5 - - - - -
No. 1 McGill Metal; aluminum-bronze alloy, suitable for pump liners, gears, corrosion-resistant castings and parts requiring strength, toughness with minimum weight.

1 - 3 - - - - - - 10
No. 2; McGill silicon-bronze; corrosion-resistant; resists heat to 500 deg F; medium abrasion resistance; ts, 95,000; Bhn, untreated, 160-180.

1 - - 4 - - - - - -
No. 4 McGill bronze hydraulic pressure castings; finished casting tolerance of ±.005.

1 - 3 - - - - - - -
MD METAL POWDERS—Metals Disintegrating Co. Inc., Elizabeth, N. J. Alloy, antimony, aluminum (grain), bismuth, brass, bronze, cadmium, chromium, copper, iron, lead, manganese, molybdenum, nickel, silicon, silver, solder, tin, titanium, tungsten and zinc metal powders, having properties such as elimination of machining, compositions impossible to obtain by conventional methods, high surface area, catalytic work, etc.

- 2 3 4 - - - - - - -
MEEHANITE—Meehanite Metal Corp., New Rochelle, N. Y., and foundries as listed hereunder. A sorbo-pearlitic iron containing silicon, manganese, phosphorus, sulphur and carbon, composition depending upon mixture and physical constitution as determined by service requirements; twenty-one grades, some of which can be heat treated, and flame hardened, each having a separate and distinct combination of physical properties; available in cast form; for machinery and miscellaneous castings.

Foundries include the following: American Brake Shoe Co., Mahwah, N. J.; Atlas Foundry Co., Detroit; Banner Iron Works, St. Louis; Barnett Foundry & Machine Co., Irvington, N. J.; E. W. Bliss Co., Brooklyn; H. W. Butterworth & Sons Co., Bethayeres, Pa.; Continental Gin Co., Birmingham, Ala.; M. H. Detrick Co., Newark, N. J.; The Elliott Co., Jeanette, Pa.; Farrel Birmingham Co., Ansonia, Conn.; Otis-Fensom Elevator Co. Ltd., Hamilton, Ont.; E. Long Ltd., Orillia, Ont.; General Electric Co., Ontario, Calif.; Valley Iron Works Inc., St. Paul; Greenlee Foundry Co., Chicago; American Laundry Machinery Co., Rochester, N. Y.; Cincinnati Milling Machine Co., Cincinnati; Cincinnati Grinders Inc., Cincinnati; Cooper Bessemer Corp., Grove City, Pa., and Mt. Vernon, O.; Crawford & Doherty Foundry Co., Portland, Oreg.; Florence Pipe Foundry & Machine Co., Florence, N. J.; The Newark Stove Co., Newark, O.; Fulton Foundry & Machine Co. Inc., Cleveland· General Foundry Mfg. Co., Flint, Mich.; Stearns-Roger Mfg. Co., Denver, Colo.; Hamilton Foundry & Machine Co., Hamilton, O.; Kanawha Mfg. Co., Charleston, W. Va.; Kinney Iron Works, Los Angeles; Koehring Co., Milwaukee; Henry Perkins Co., Bridgewater, Mass.; Pohlman Foundry Co., Buffalo, N. Y.; Rosedale Foundry & Machine Co., Pittsburgh; Warren Foundry & Pipe Corp., Phillipsburg, N. J.; Vulcan Foundry Co., Oakland, Calif.; Ross-Meehan Foundries, Chattanooga, Tenn.; Traylor Engrg. & Mfg. Co., Allentown, Pa.; Vancouver Engrg. Works, Vancouver, B. C.; Washington Iron Works, Seattle; Washington Machinery & Supply Co., Spokane, Wash.

See advertisement, Page 315

- 2 - - - 6 - - - - -
METALINE—R. W. Rhoades Metaline Co. Inc., Long Island City, N. Y. Lubricating insert plugs of several diameters and lengths and in varied compositions for rendering bronze bearings and bushings oilless. Also bronze bearings complete in which Metaline plugs are inserted, furnished as finished bearings.

- - - 4 5 - - - - -
MICHIGAN Seamless—Michigan Seamless Tube Co., South Lyon, Mich. Cold drawn seamless steel tubing. Aircraft, pressure and mechanical types. Round, hexagon, square, rectangular and shapes. Carbon and alloy analysis.

See advertisement, Page 172

- 2 - - - 6 - - - - 10
MIN-OX—The Binney Castings Co., Toledo 7, O. Heat-resistant castings for molds, valves, plungers, neck rings and other necessary mold parts for production of glass. Also known as Binney Metal.

- - 3 - - 6 - - - -
MOCCASIN—Moccasin Bushing Co. A bearing material with an analysis of 80 copper, 10 tin, 10 lead; furnished in rough bars or billets, finished rods or bars; for sand casting; abrasion resistant; for bearing applications. Easily machinable.

- - - - - - 6 - - - -
MOGUL BABBITT—Federal-Mogul Corp., Detroit.

Mogul alloy genuine babbitt; made from tin, antimony and copper, virtually lead free; hard, tough alloy; high tensile strength; suitable for die-cast and hand-poured bearings. Used for high-speed automobile and aircraft engine, steel and bronze back main and connecting-rod bearings, trucks, tractors, high-speed machinery, planers, etc.

Mogul bearing metal; general all-purpose babbitt for bearings requiring toughness. Used for machinery bearings, stationary gas engines, paper mill, rolling mill, rubber plant and brick machinery.

407 nickel babbitt; varying slightly from Mogul genuine babbitt alloy. For applications where speed is fairly high and bearings are large, that is 1/16th-inch or more in thickness. Used in woodworking machinery and other heavy-duty types.

408 special babbitt (copper-hardened); originally produced for electric railway armatures, now used for special bearing applications; has great durability and will stand up under hard wear. Used in motor pumps, motor shafts, rock crushers, forming presses.

Duro antifriction metal; while softer and less tough than Mogul bearing metal (above), compares favorably with lead-base general purpose babbitts. Used for flour mill, laundry, canning and bottling machinery, pump packing, slow-moving pulleys and axle bearings.

Special "B"; a lead and antimony alloy; free of usual nonbearing ingredients. Used for slow-speed bearings and heavy line shafting.

- 2 3 4 - - - - - - -
MO-LYB-DEN-UM—Climax Molybdenum Co., New York 18. An alloying element for use in steel and iron. Imparts strength, toughness, ductility and resistance to abrasion; improves fatigue value, eliminates temper embrittlement, increases physical properties at elevated temperatures; molybdenum steel is easily welded and machined.

See advertisement, Page 170

- - 3 - - - - - - -
MO-MANG—American Manganese Steel Div., The American Brake Shoe & Foundry Co., Chicago Heights, Ill. Manganese 12-14, carbon .7-.9, with molybdenum; welding-rod for manganese steel and other ferrous castings.

- 2 3 4 - - - - - - -
MO-MAX—The Cleveland Twist Drill Co., Cleveland 14. A high-speed steel, in rough bars or billets, finished rods or bars, wire and sheets, for hot forging, turning, boring, welding, etc; resists heat to 1100 deg F; high abrasion resistance; high tensile strength;

good bearing properties; sp gr about 7.95; good weldability; Bhn, untreated, 220, heat-treated 700. For use where great strength and wear resistance up to temperatures of 1000 deg F are required such as gears, cams, guides, wearing plates, etc. Licensees are: Allegheny Ludlum Steel Co., Atlas Steels Ltd. (Canada), Bethlehem Steel Co., Braeburn Alloy Steel Corp., Carpenter Steel Co., Crucible Steel Co. of America, Henry Disston & Sons Inc., Halcomb Steel Div., Crucible Steel Co. of America, Jessop Steel Co., Latrobe Electric Steel Co., Universal-Cyclops Steel Corp., Vulcan Crucible Steel Co., Simonds Saw & Steel Co., Vanadium-Alloys Steel Co., and Columbia Tool Steel Co.

1 - 3 4 5 - - - - 10
MONEL—The International Nickel Co. Inc., New York. Nickel 67, copper 30, iron 1.4, manganese 1, silicon .1, carbon .15, sulphur .01; general-purpose, corrosion-resistant, high-strength, rust proof alloy. Used for applications requiring protection against chemical reaction, high mechanical properties and attractive appearance.

- - 3 4 - - - 8 - -
K Monel; nickel 66, copper 29, iron .9, manganese .85, silicon .5, carbon .15, sulphur .005, aluminum 2.75; heat-treatable alloy affording corrosion and abrasion resistance plus mechanical properties comparable to those of heat-treated alloy steels; nonmagnetic. For parts requiring corrosion resistance, high mechanical or nonmagnetic properties.

1 - 3 4 - - - - - - -
KR Monel; chemical composition, resistance to corrosion, mechanical, magnetic and heat-treating properties same as those of K Monel; high ductility; has improved machinability. Available only in rod and wire forms.

- - - 4 5 - - - - 10
R Monel; nickel 67, copper 30, iron 1.7, manganese 1.1, silicon .05, carbon .1, sulphur .035. For parts requiring corrosion and abrasion resistance combined with free-cutting qualities permitting high-speed automatic machine work.

- 2 - 4 - - - 8 - -
S Monel; nickel 63, copper 30, iron 2, manganese .9, silicon 4, carbon .1, sulphur .015; high-strength, corrosion and abrasion-resistant material for castings requiring extra hardness for resistance of galling and seizing.

See advertisements, Pages 163, 250

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MORAINE—Moraine Products Div., General Motors Corp., Dayton, O. Rolled bronze split-type bearings and bushings for automobiles, electric motors and farm implements.

See advertisement, Page 162

1 2 - - - 6 - - - -
MORGANITE—Morganite Brush Co. Inc., Long Island City, N. Y. Carbon-graphite, and carbon-graphite-metal mixtures; in finished rods or bars and plates, for turning, boring, molding, etc; resists corrosion caused by any liquid handled industrially; resists heat to 700 deg F; good abrasion resistance; ts, ult 1000-3000 psi; compressive 10-30,000; ductility, low; sp gr, 2-2.15. Used for bearings, valves, seals, nonfriction slides, piston rings, etc.

See advertisement, Page 275

1 - 3 - - - - - - -
MRCO METAL POWDER—Metals Refining Co., Hammond, Ind. Metal powders furnished in the following grades:

40 RL; copper 99.4; all passing in a 40-mesh sieve, not over 20 per cent passing a 200-mesh screen; has apparent density of 2.5 grams per cu cm. Used in commutator brushes, chemical porous filters, catalyzers, and pressed metal compositions.

100 RXA; copper 99.4; all passing a 100-mesh screen; not over 45 per cent passing a 325-mesh screen; has apparent density of 2.7 grams per cu cm. Used in porous metal bearings, intricate pressed metal shapes, electrical commutator brushes, etc.

150 RXA; copper 99.4; all passing a 150-mesh sieve, not over 75 per cent passing a 325-mesh sieve; has apparent density of 2.7 grams per cu cm. For same applications as 100 RXA.

200 RL; copper 99.4; all passing a 200-mesh sieve, and not less than 85 per cent passing a 325-mesh sieve. Used in chemical equipment, special commutator brushes, small pores in porous bearing compositions; also has advantages for copper brazing and coating welding rods.

500 RL; copper 99.4; all passing a 325-mesh sieve, and substantially all particles are less than 15 microns in diam. For use where extremely fine particle size is desired, in brazing and coating, also as clutch facings, etc.

I-100; iron 96 min; all passing a 100-mesh sieve, and 25-45 percent passing 325-mesh sieve; has apparent density of about 1.8-2.0 grams per cu cm. For pressed parts such as clutch facings, gears, filters, catalyzers, etc.

I-120; iron 96 min; all passing 100-mesh sieve and 30-50 per cent passing 325 mesh. Has apparent density of 2.3-2.5 grams per cu. cm. Same uses as I-100.

I-147; iron 96.5 min; all passing 40 mesh sieve and 10-20 per cent passing a 325-mesh sieve. Has apparent density 1.8-2.0 grams per cu cm; same uses as I-100.

I-247; iron 97 min; apparent density 2.65-2.85 grams per cu cm; all passing a 40-mesh sieve with 10-20 per cent passing 325-mesh sieve; hydrogen-annealed for pressed ferrous metal compositions and electrical parts requiring high priority iron.

I-257; iron 96 min; all passing 100-mesh sieve; 55-70 per cent passing 325-mesh sieve. Used where extremely fine particle size is required.

I-297; iron 97 min; apparent density 1.9-2.1 grams per cu. cm; all minus 100-mesh sieve, with 20-30 per cent passing 325-mesh sieve; hydrogen-annealed. Used for same purpose as I-247.

I-312; iron 97.5; apparent density 1.9-2.1 grams per cu cm; all passing 40-mesh sieve; 15-25 per cent passing 325-mesh sieve; hydrogen annealed. Used for same purpose as I-247.

100B; 99.7 per cent lead; all passing 100-mesh sieve; not over 70 per cent passing 325-mesh sieve; apparent density 5.6 grams per cu cm. Used for brake linings, metallic clutch facings, porous bearings, metallic filters, X-ray rubber sheets, X-ray shields and special alloys.

F; 99.7 per cent lead; all passing a 200-mesh sieve and substantially all particles less than 20 microns in diam. Used for same applications as 100B.

1 - 3 4 - - - - - - -
MUELLER 600 Bearing Metal—Mueller Brass Co., Port Huron, Mich. Copper 56-60, lead .5 max, manganese 1.25-3.5, aluminum .5-2, silicon .5-1.2, iron .6 max, and remainder zinc. Sold as extruded or extruded and drawn, and rods and bars, and as die forgings from rod. Ts, 70-85,000 psi; yield point (½ per cent extension) 45-50,000; elongation, in 2 in., 20 to 10 per cent for die forgings. Sp gr 8.071; conductivity about 12 per cent of copper; nonmagnetic; good corrosive resistance against sea water. Used as low speed heavily loaded bearings as it withstands damage from lubricants carrying considerable sulphur compounds. Also used for high-speed bearings on hardened mating surfaces, cam faces and machine parts, subject to wear, such as pump rods and shafts, and forged connecting rods for high-speed service.

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MUMETAL — Allegheny Ludlum Steel Corp., Brackenridge, Pa. A very high permeability nickel copper iron alloy, that must be very high-temperature, dry-hydrogen annealed after fabrication. Sold principally in form of sheets, strip, bars, and laminations, also shields. For special electrical instruments and transformers requiring highest performance. Typical analysis—nickel 76, copper 4½, chromium 1½, balance iron.

See advertisement, Page 157

1 - 3 4 - - - - - - -
MUREX—Metal & Thermit Corp., New York. A series of welding electrodes designed for welding mild steel, carbon-molybdenum steel USS. Cor-Ten and Mayari, Cromansil, nickel steels, chrome-molybdenum, chrome-nickel, straight chrome, manganese, stainless and high-carbon steels and for building up and hard surfacing.

N

1 2 3 - - - - - - -
NA, NA-1, NA-2—National Alloy Steel Division, Blawnox, Pa. Varying percentages of nickel and chromium.

- - 3 4 - - - - - -
NACO—National Malleable & Steel Castings Co., Cleveland. Specially processed cast steel; for service where heavy blows and constant friction require a material that combines great strength, toughness and resistance to wear. Used in chains for steam shovel, dragline, draft gears, railway equipment.

1 - - - - 6 7 - - -
NATIONAL—National Molded Products Inc., St. Marys, Pa. Copper 90, tin 10; furnished in powder; nonmagnetic; corrosion-resistant; heat-resistant to 400 deg F; abrasion resistance, high. For bearings or intricate parts.

- - - 4 - - - 8 - 10
NATIONAL Graphitic Steel—National Malleable & Steel Castings Co., Cleveland. High-strength steel furnished in castings. Has medium abrasion resistance; minimum ts, 75,000 psi avg; can be flame hardened; avg Bhn, 200. Used for automotive and other medium size castings requiring high strength and good machinability.

1 - - 4 5 - - 8 - 10
N-A-X—Great Lakes Steel Corp., Div. of National Steel Corp., Ecorse, Mich.

- - - 4 - - - 8 - 10
9100 Series; carbon .1-.7, manganese .6-.75, phosphorus .040 max, sulphur .05 max, silicon .6-.9, chromium .5-.65, molybdenum .1-.2, and zirconium .05-.15. Furnished in rough bars or billets, finished rods or bars, strips (coiled), sheets and plates, for forging, stamping, turning, boring, etc. Recommended heat treatment: Quench and draw—carburizing grades treated by regular conventional methods. This series has a chemical analysis constant within definite ranges except for carbon and molybdenum, which provide a basis for use.

High tensile; carbon .12, manganese .70, silicon .80, chromium .60, sulphur .030, phosphorus .025, and zirconium .10. Furnished in rough bars or billets, finished rods or bars, strips (coiled), tubing, wire, sheets and plates for stamping and welding. Physical properties of material are inherent in the "as rolled" condition. No subsequent treatment needed after hot working. Good stability and ductility permitting it to be cold-formed; good impact resistance; high fatigue resistance; good welding properties. Used for machine parts where high torsional properties, high tensile strength and resistance to fatigue and notch impact at normal and sub-zero temperatures are required.

- - - 4 - - - - - -
NELOY—National-Erie Corp., Erie, Pa. Steel castings, rough, finished, machined or flame hardened. High strength and hardness due to combination of alloying and special hardening. Has high abrasion resistance. Used for various applications in rolling mills and steel works equipment, overhead traveling cranes, power shovels, drag lines, and other heavy machinery.

1 - - - - - - - 8 - 10
NEY-ORO G—The J. M. Ney Co., Hartford, Conn. Gold-platinum-silver-copper alloy in wire, sheets, coiled strips, and plates; for stamping, turning, boring, welding and soldering. Mechanical properties in heat-treated state; ult ts, 160,000 psi; yield point, 154,000; elongation, 6 per cent; impact resistance, high; Bhn, 280; non-magnetic; weldability, good; abrasion resistance, medium. For pivots, small bearings, springs and electrical contacts.

1 2 - - - - - 7 - - -
NICHROME—Driver-Harris Co., Harrison, N. J. Acid and alkali, heat-resistant alloy consisting of nickel 60, iron 25, chromium 15, resists heat to 2000 deg F. Recommended for furnace parts, acid dipping baskets, and filter screen.

A; nickel 62, chromium 15; heating element material, also for electrical devices including rheostats, potentiometers, seamless tubing, etc.

B; as an addition to cast iron; sold in ratios of 5 and 2½ parts of nickel to 1 part of chromium.

V; nickel 80, chromium 20; heating element material; also in sheets for welded tubing.

Cast Nichrome; for furnace parts, pyrometer protection tubes, conveyor castings and carburizing containers. Sheet Nichrome S; sheet; nickel 27, chromium 15, used for various applications.

1-Corrosion resistant | 2-Heat resistant | 3-Abrasion resistant | 4-High tensile strength | 5-High ductility | 6-Bearing application | 7-Electrical uses | 8-Heat treating | 9-Low specific gravity | 10-Machinability

1 - - 4 5 - - - - - -
NICKELCHROMEWELD—Lincoln Electric Co., Cleveland. Heavily coated electrode of shielded arc type for welding of Inconel and similar alloys of 70-80 per cent nickel, 11-15 per cent chromium and 5-10% iron.

1 - - - 5 - - - - - -
NICKELOID—American Nickeloid Co., Peru, Ill., Nickel bonded to zinc, latter serving as rustproof, flexible and inexpensive white metal base. Available in variety of brilliant finishes and patterns, as sheets, flat strips and coiled strip for continuous feed automatic presses. Can be supplied with quick removable, gum-adhered paper covering, permitting drawing and forming without marring prefinish.

1 - - 4 - 6 - - - - -
NICUITE—A. W. Cadman Mfg. Co., Pittsburgh. Nickel-bronze; tin 10, nickel 3.5, zinc 2.5, trace of phosphorus, balance copper; high compressive strength. For slow or medium speed operation under extreme pressures.

- - 3 - - - - - - -
NI-HARD—International Nickel Co. Inc., New York, and licensees. Nickel 4.5, chromium 1.5, total carbon 2.7-3.6. Cast iron for chilled rolls, grinding balls, mill liners, etc., where abrasion is encountered.

See advertisements, Pages 163, 250

1 2 - - - - 7 - - - -
NILVAR—Driver-Harris Co., Harrison, N. J. A 36 per cent nickel steel having the lowest coefficient of expansion to 392 deg F of an alloy. Used for thermostatic controls in heating apparatus such as electric ovens, laboratory ovens, gas ovens, oil burners, and house heating apparatus.

1 2 - - - - - - - - -
NI-RESIST—International Nickel Co. Inc., New York and licensees. Nickel 14, copper 6, chromium 2, total carbon 2.60-3.10, silicon 1.25-2, manganese 1-1.5. For castings handling corrosive waters and other solutions, or heats above the range of temperature where ordinary cast iron gives good service. Resists corrosive vapors, gases and liquids. Recommended instead of plain cast iron under such conditions.

See advertisements, Pages 163, 250

1 2 - 4 - - - - - - -
NIREX—Driver-Harris Co., Harrison, N. J. Acid-resisting material with tensile strength, annealed, up to 95,000 psi; spring temper 180,000; supplied in finished rods or bars, wire, sheets and strip; also can be fabricated by sand casting. For use where corrosion and heat resistance, and spring properties will be useful.

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NI-TENSYLIRON—International Nickel Co. Inc., New York, and licensees. Nickel 1-4, total carbon 2.5-3.15, silicon 1.2-2.75, manganese .5-.9. For machine tool castings, diesel engine housings, cylinder blocks, pistons, etc.

See advertisements, Pages 163, 250

1 - 3 4 - - - - - - -
NITRALLOY—Nitralloy Corp., New York, controls nitriding process and licenses under which alloy is produced. A chromium-molybdenum-aluminum steel capable of developing extreme hardness through nitriding; for cams and camshafts, gears, pump parts, splined shafts, cylinder liners, etc. Licensees include Allegheny Ludlum Steel Corp., Bethlehem Steel Co., Crucible Steel Co. of America, Firth-Sterling Steel Co., Republic Steel Corp., Rotary Electric Steel Co., The Timken Roller Bearing Co., Vanadium Alloys Steel Co., Copperweld Steel Co., and Atlas Steels Ltd.

See advertisement, Page 268

1 2 3 - - - - - - - -
NUREX—National Malleable & Steel Castings Co., Cleveland. A chromium-manganese-carbon alloy furnished in castings. Resists corrosion caused by dilute aqueous solutions and acids (except phosphoric). Resists heat to 1700 deg F. Abrasion-resistant. Used for mill balls, lining and similar purposes.

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- - - 4 - 6 - - - 10
OH-38 Aluminum Alloy—Oscar W. Hedstrom Corp., Chicago. Iron 1.25, silicon 1.5, copper 3, zinc 10 (nominal); furnished as castings. No heat treatment is necessary. Ult ts, 35,000 psi; yield point, 29,000 psi; elongation, 2.5 per cent; Bhn, 98; sp gr, 2.88 (.106 lb per cu in.); nonmagnetic; weldability, good. Resists corrosion caused by vegetable juices, CC/4; heat-resistant to 900 deg F; abrasion resistance, high. For all types of mechanical machinery and devices.

See advertisement, Page 305

- - - - - - 7 - - -
OHMALOY—Allegheny Ludlum Steel Corp., Brackenridge, Pa. An alloy for high electrical resistance applications, such as motor starters, crane motor controls, and mine locomotive controls. Available in all forms. Approximate analysis—chromium 12, aluminum 4¼, iron balance.

See advertisement, Page 157

- - - - - - 6 - - - -
OILITE—Chrysler Corp. Amplex Div., Detroit, Mich. Oil cushion, heavy-duty bronze bearings containing one-third oil by volume; used extensively in aircraft, aircraft instruments, tanks, trucks, etc.

Super-Oilite; a porous oil cushion extreme pressure self-lubricating bearing permitting an allowable bearingload of 50 000 psi under zero velocity. Furnished as finished parts or in bars, plates, and irregular shapes; good bearing properties; high porosity oil cushion; high strength, ductility. For landing gears, controls, locomotives, etc.

Super-Oilite "16"; a porous oil cushion extreme high-pressure self-lubricating bearing; has high oil content, extreme hardness with an allowable bearing load exceeding 100,000 psi under zero velocity, and excellent bearing qualities. For bearing applications.

Iron-Oilite; a porous pure iron self-lubricating bearing, oil impregnated; copper free, porous oil cushion bearing. Resists corrosive effects of sulphur, its compounds and similar agents. Used for bearings in pumps.

Aluminum-Oilite; a porous lightweight self-lubricating oil impregnated bearing; porous. Eliminates galvanic action with surrounding aluminum housings often discovered with bearings which form a galvanic cell with aluminum. Used for bearings for aircraft controls, and wherever lightness is important.

1 - - 4 5 - - - - - -
OLYMPIC BRONZE—Chase Brass & Copper Co., Waterbury 91, Conn.

Type A; copper 96, silicon 3, zinc 1; tensile strength, 55-150,000 psi; brinell hardness acid and alkaline solutions; used for welded 70-200. Resists corrosion due to saline, structural parts, bolts, nuts, tubing, tie rods, etc.

Type B; copper 97.5, silicon 1.5, zinc 1; tensile strength, 45-90,000 psi. Resists corrosion due to saline, acid and alkaline solutions; used for bolts, nuts, pipe and tubing.

1 - 3 - - - 7 - - -
OREIDE—Scovill Mfg. Co., Waterbury, Conn. Copper 90, tin .5, balance zinc; in finished rods or bars, tubing, wire, sheets and strips (coiled); for stamping, turning, boring, etc., into machine parts; medium abrasion resistance; ts, 95,000 psi (hard drawn or rolled); sp gr, 8.8; bearing properties fair; electrical properties fair; recommended heat treatments, anneal at 975-1025 deg F; spring properties good. Used primarily for spring contacts and switch parts.

- - - 4 5 - - - - 10
OSTUCO—Ohio Seamless Tube Co., Shelby, O. Precision tubing; seamless and electric-welded. Formerly known as Ohio Special Quality tubing.

See advertisement, Page 277

1 - - 4 5 6 - - - -
OXWELD—Linde Air Products Co., The, New York.

- - - 4 5 - - - - -
No. 1; welding rod for steel giving welds of high tensile strengths up to 70,000 psi.

- - - - 5 - - - - -
No. 7; drawn iron welding rod giving welds where high tensile strength is not a factor.

No. 9; cast iron rod (round) for gray iron castings.

1 - - - 5 - - - - -
No. 23; welding rod for cast aluminum and aluminum alloys, giving high tensile strength.

- - - 4 5 6 - - - -
No. 25M; bronze welding rod having brinell hardness of 96 and high tensile strength.

No. 28, a columbium bearing welding rod suitable for 18-8 stainless steel.

See advertisement, Pages 248, 249

P

1 - - 4 - - - - - -
PAGE Wire—Page Steel & Wire Div., American Chain & Cable Co. Inc., Monessen, Pa. Low and high-carbon steel wire, also ingot iron wire, and stainless steel wire; furnished in various strengths and hardness numbers; magnetic and nonmagnetic; heat resistant to 2150 deg F (stainless); used for various applications.

1 - - - 5 - - - - -
PAINTGRIP Cold-Rolled—American Rolling Mill Co., Middletown, O. Iron or steel sheets or coils mill-treated with an electrolytic "flash" of zinc and then bonderized. Will draw, form, weld and solder readily. Eliminates bonderizing after fabrication.

1 - - - - - - 8 - 10
PALINEY—The J. M. Ney Co., Hartford, Conn. No. 6; palladium-platinum-silver-copper-nickel alloy; in wire, sheets, coiled strips, and plates for stamping, turning, boring, welding and soldering. Mechanical properties in heat-treated state; ult ts, 170,000 psi; yield point, 127,000; elongation, 15 per cent; Bhn, 270; sp gr, 10.9; nonmagnetic; abrasion resistance, medium. Used for pivots, small bearings, springs, electrical contacts etc.

No. 7; similar to No. 6 in analysis with the addition of gold; available also in the same form. In heat-treated state, ult ts, 180,000 psi; yield point, 148,000; elongation, 9 per cent; impact resistance, high; Bhn, 280; sp gr, 11.9; nonmagnetic; weldability, good. For same uses as foregoing.

1 2 3 4 - - - - - - -
PAR—Crucible Steel Casting Co., Cleveland.

- - 3 4 - - - - - -
No. 2; carbon .25, silicon .45, manganese .65, nickel 2.75, chromium 1.75, molybdenum .3, phosphorus .05; sand castings. Mechanical properties in heat-treated state: ult ts, 100,000 psi; yield point, 75,000 psi; elongation, 20 per cent; impact resistance, low; Bhn, 230; magnetic; abrasion resistance, high; can be heat-treated for good wear resistance.

1 2 - - - - - - - - -
No. 6; carbon .2 max, silicon .85, manganese .7, chromium 25, nickel 12; sand castings. Mechanical properties in heat-treated state: ult ts, 80,000 psi; yield point, 42,000 psi; elongation, 32 per cent; impact resistance, high; Bhn, 165; sp gr, 7.5; nonmagnetic. Resists corrosion caused by sulphur dioxide; heat-resistant to 2000 deg F; abrasion resistance, low. Used for furnace parts and machine parts where corrosion resistance is desired.

No. 7; carbon .3, silicon .85, manganese .7, nickel 35, chromium 15; sand castings. Mechanical properties in untreated state: Ult ts, 73,000 psi; yield point, 41,000 psi; elongation, 7 per cent; impact resistance, low; Bhn, 170; sp gr, 7.8; nonmagnetic; corrosion resistant, good for hydrochloric acid solutions; heat-resistant to 2000 deg F; abrasion resistance, low. For heat-treating furnace parts, carburizing boxes, etc.

- - 3 4 - - - - - -
PENN—Titan Metal Mfg. Co., Bellefonte, Pa. General purpose bronze welding rod where high-strength ductile welds are desired. Resists abrasion.

1 - 3 4 - - - - - -
PERDURO—The Jeffrey Mfg. Co., Columbus, O. Total carbon .60-1.90, combined carbon .40-.60, manganese .50-.70, silicon .90-1.10, copper .90-1.10. Malleable iron castings; heat treated; ts, 80-90,000 psi; yield point, 60-70,000 psi; elongation in 2 in., 8-6 per cent; Bhn, 179-207. For chain links, sprockets, etc.

1 2 - 4 5 - - - 9 -
PERMITE—Aluminum Industries Inc., Cincinnati. Following grades available as sand castings, and permanent mold castings.

1 2 - 4 - - - - - -
No. 1002; copper 10, iron 1.5, magnesium .4, balance aluminum. For pistons for automotive, pump and refrigeration service.

1 - - 4 5 - - - - -
No. 1010; copper 4, silicon 1, balance aluminum. For machine parts to resist shock. Heat treatment is to soak at critical and

quench in water, and reheat at 850 deg F to desired properties.

1 - - 4 - - - - - 9 -
No. 1019; furnished in ingots and sand castings and permanent mold castings; silicon 5, copper 1.25, magnesium .5, balance aluminum; heat treatment, quenching in water. Suitable for highly-stressed parts including airplane engine parts.

1 - - - 5 - - - - 9 -
No. 2011; silicon 5, balance aluminum. For parts subject to atmospheric corrosion.

1 - - 4 - - - - - 9 -
No. 2021; magnesium 4, balance aluminum. For parts subject to salt water corrosion.

1 - - 4 - - - - - 9 -
No. 2023; magnesium 10, balance aluminum. For parts subject to high stress; furnished heat treated.

PHILO—Ohio Ferro Alloys Corp., Canton, O. Ferro alloys for deoxidizing agents and for alloying in the production of iron and steel.

1 - - 4 - - 7 - - -
PHOS-COPPER—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., brazing alloy manufactured in rod and strip form, containing 5-7 per cent phosphorus and balance copper; highly corrosion-resistant; gives strong joints when used for brazing copper and copper alloys to each other.

- - - 4 5 - - - - 10
PITALOY—Pittsburgh Steel Foundry Corp., Glassport, Pa. Manganese-molybdenum alloy; ts, 85,000 psi; yield point, 55,000 psi; elongation, 22 per cent; reduction of area, 40 per cent; machinability, good. Used for locomotive frames, crossheads, coupling boxes and spindles, driving wheel centers, gears, crane wheels, etc.

See advertisement, Page 257

1 2 - 4 5 - - 8 - 10
PITTSBURGH Alloy and Stainless Steels—Pittsburgh Steel Co., Pittsburgh.

- - - 4 5 - - - - -
Open-hearth aircraft or commercial quality alloy steels in bars, billets, rods and wire.

- - - - - - - 8 - 10
AMS6320A (NE8735); Good machining properties in annealed state and capable of being heat-treated to required physicals in the finished size.

NE8630; for cold heading bolts—superior cold heading quality and hardness after heat-treating.

- - - 4 5 - - - - -
A4337; high alloy open-hearth steels; can be heat-treated to high yield strength and high ductility.

1 2 - 4 - - - - - -
Stainless steels of various chromium-nickel-carbon types.

301, 302, 304, 308; chrome-nickel or 18-8 austenitic type, high corrosion resistant, high tensile, heat-resistant grades. Used for spring wire, wire for food equipment, welding wire, bolts, etc.

303; chrome-nickel free-machining austenitic type for screw machine stock.

319, 310; high chrome-nickel grades used for welding wire and places where high heat resistance is required.

316, 317; chrome-nickel-molybdenum types. Used where higher acid corrosion resistance is required, such as chemical, paper and textile industries.

321, 347; chrome-nickel grades stabilized with titanium or columbium to decrease intergranular corrosion after welding or heating.

410, 414; straight chrome, heat-treatable grades. Used where high physical properties are required.

416; straight chrome, free-machining type; also heat-treatable.

420; straight chrome, high carbon type; also heat-treatable.

430; straight chrome grade somewhat more corrosion-resistant than 410, 414, 416 or 420. Not heat-treatable but readily fabricated. Used for parts where high luster, decorative parts are required.

501, 502; 4-6 chromium grades for structural purposes with heat and corrosion resistance greater than carbon steels, but lower than any of the above types.

1 - - 4 5 - - - - -
PLANEWELD—Lincoln Electric Co., Cleveland. Shielded arc electrode for welding SAE 4130 and X4130 chrome-moly steels and all sheet metal, such as are widely used in airplane construction. For welding all positions.

Type No. 1; is intended for use on landing gears, tail wheel assemblies, etc. in metal thickness of .120-inch and up.

Type No. 2; is used for airplane tubing and similar construction of light gages up to about 7/64-in. thickness. It gives a minimum of penetration. slag is easy to remove.

- - - - 5 6 7 - - -
PLAST-IRON—Plastic Metals Inc., Johnstown, Pa. Powder metal consisting of 99.9 per cent iron; for pressing and sintering. After pressing in die, material is sintered in protective atmosphere at 1800 deg F to 2200 deg F for from 30 to 90 minutes. Apparent density of powder, 2.2-2.7 grams per cu cm; weldability, good; abrasion resistance, high. For oilless bearings, permanent magnets, iron cores, and other parts made by powder metallurgy.

- - 3 4 - - - - - -
PLAST-MANGANESE — Plastic Metals Inc., Johnstown, Pa. Powder metal consisting of 99.9 per cent manganese. Apparent density 3.5 grams per cu cm; nonmagnetic. For strong, hard ferrous parts made by powder metallurgy.

1 - 3 - - - 7 - - -
PLAST-SILICON—Plastic Metals Inc., Johnstown, Pa. Silicon 97, iron 1, oxygen 2. Powder metal for alloying. Apparent density, .9 to 1.3 grams per cu cm; nonmagnetic. For parts made by powder metallurgy requiring special corrosion resistance or electrical properties.

- - - - 5 6 7 - - -
PLAST-SPONGE—Plastic Metals Inc., Johnstown, Pa. Silicon 97, iron 1, oxygen 2 silicon, .2, manganese .3, phosphorus .1 and oxygen .9. Powder metal for pressing and sintering. After pressing in die, sinter in protective atmosphere at 1800 deg F to 2200 deg F for from 30 to 90 minutes. Apparent density of powder, 2.2-2.7 grams per cu cm; magnetic; weldability, fair; abrasion resistance, high. For oilless bearings, permanent magnet iron cores, and other parts made by powder metallurgy.

1 2 - - - - - - - -
PLATINUM-CLAD—Baker & Co. Inc., Newark 5, N. J. Pure platinum welded to various base metals, in sheet, tubing and wire. Resists corrosion caused by usual acids; medium abrasion resistance; good weldability; tensile strength, ductility, etc., are dependent upon properties of base metals. Used for tubing exposed to acids and for vessels subject to same.

1 2 3 - - - - - - -
PLURAMELT—Allegheny-Ludlum Steel Corp., Brackenridge, Pa. Combination of mild steel and stainless steel; in sheets, strips, and plates; for general fabrication; corrosion resistant. Combines qualities of the stainless steel and plain steel of which it is composed.

See advertisement, Page 157

1 - 3 4 - - - - - -
POMPTON—Allegheny Ludlum Steel Corp., Brackenridge, Pa. Carbon .95-1.05. For arbors, bushings, collets and lathe centers. Water hardening.

See advertisement, Page 157

1 - 3 - - 6 - - - -
POREX—Moraine Products Div., General Motors Corp., Dayton, O. Filtering and diffusing material product of powder metallurgy in bronze, iron, and other metals; provides high flow rates, low flow resistance; used in fuel and lubricating systems, instruments, breathers, burners, separators, etc.

See advertisement, Page 162

1 - - 4 - 6 - - - -
POWDIRON—Bound Brook Oil-Less Bearing Co., Bound Brook, N. J. Porous iron bearing alloys available in three grades. All have high compressive strength.

55P; contains no tin and only 5 per cent copper. Used to conserve copper and tin. Ult ts, 12,000 psi; sp gr, 5.5; compressive, 140,000. Subject to corrosion under certain conditions but due to protective film of oil, will show less tendency to corrode than steel shaft.

61-IC; contains no tin and only 10 per cent copper, and is impregnated with 25 per cent of oil by volume. Stronger than other materials furnished by company, and recommended for heavy-duty slower motion requirements where tensile strength is determining factor as in aviation and ordnance industries. Ult ts, 30,000 psi; compressive, 140,000.

59-I; straight-iron material impregnated with 25 per cent oil by volume. Recommended for parts other than bearings which may or may not be sized to close dimensions. Smooth mirror finished surface reduces friction. Ult ts, 12,000 psi; compressive, 130,000.

See advertisement, Page 302

1 - - - - - - 7 - 9 -
PRECISION—Precision Castings Co. Inc., Syracuse, N. Y.

Type A-12; aluminum base alloy; silicon 12, balance aluminum; resists heat to 1000 deg F, ts, 33,000 psi; sp gr, 2.66. For general aluminum die casting uses.

Type ZN-5, zinc base alloy; aluminum 4, copper 1, magnesium .04, balance zinc; ts, 42,000 psi; compressive, 85,000; sp gr, 6.71; Bhn, 75. For general die casting uses—automotive, washing machines, electrical equipment, etc.

A-50; aluminum base alloy; silicon 5, balance aluminum; furnished as castings; resists corrosion caused by atmosphere foods, etc., resists heat to 1000 deg F; abrasion resistance, medium; ts, ult, 29,000 psi; ductility, medium. For use where corrosion resistance and ductility are essential.

- - - - - - - 7 - 9 -
A-54; aluminum base alloy; silicon 5, copper 4, balance aluminum; furnished as castings; resists corrosion caused by atmosphere; resists heat to 1000 deg F; ts, ult, 32,000 psi; general aluminum die cast parts.

A-94; aluminum base alloy. Silicon 8.5, copper 3.5, balance aluminum. Substitute for A-54 alloy wherever possible. Conforms to Federal Specification AXS-679, Rev. 3.

- - - 4 5 - - - - -
PRECISION Tubing and Wire—Precision Tube Co., Philadelphia.

Seamless tubing in nickel, aluminum alloys, copper and brass, in sizes from 3/8-in. OD down to .010-in. OD, with wall thicknesses down to .0015.

Metal shielded wire; consists of drawing seamless metal tubing over any type insulated wire. Adopted by Army and Navy for many types of instruments in aircraft.

- - - 4 - - - - - -
PREMIER—American Steel & Wire Co., Cleveland. Specially processed steel wire having high yield and fatigue strength. Used for all types of spring applications.

See advertisement, Page 169

- - 3 4 5 - - - - -
PROMAL—Link-Belt Co., Indianapolis 6. Specially processed malleable iron having high yield and fatigue strengths; for resistance to mild corrosive attack can be furnished with copper content; can be hot dip galvanized without embrittlement and can be used in ovens and furnaces up to 1100 deg F. Uses include conveyor and drive chain links, bearing caps, rocker arms, sheaves, levers and other machine parts subjected to severe service.

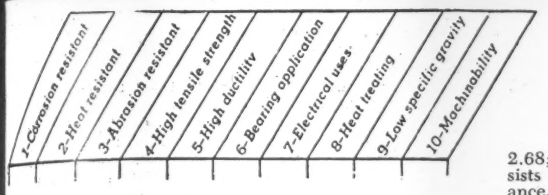
- 2 - 4 - 6 - - - -
PROMET—The American Crucible Products Co., Lorain, O. Heat-treated bronze bearing metal having great compressive strength, low coefficient of friction, lubricating qualities. For bearings and wearing parts.

- - - - - - - - - -
PSF—Pittsburgh Steel Foundry Corp., Glassport, Pa. Steel castings up to the largest in ordinary or alloy steels and Pitaloy. For railroad and marine industries; also for other types of machines.

See advertisement, Page 257

1 2 - - - - 7 - - -
PURE CARBON — Pure Carbon Co. Inc., St. Marys, Pa. For seals and wearing rings, pistons, cylinder liners, thrust bearings, etc. Furnished in plates for grinding.

- 2 - 4 - 6 - - - -
PYRAMID METAL—Magnolia Metal Co., Elizabeth, N. J. Lead-tin-antimony-arsenic alloy furnished in ingots. Ult ts, 17,850 psi; yield, 8875 psi; Bhn, 25; abrasion resistance, medium. For applications where bearings



must withstand heavy sustained pressures such as in marine reciprocating engines, water turbines, paper mill calendar stacks, etc.

1 - - 4 - - - - - - -
PYRASTEEL—Chicago Steel Foundry Co., Chicago. Nickel varies from 8 per cent up, chrome from 8.26 per cent; available as castings for heat-treating furnaces, screw conveyors, or any high temperature service to 2200 deg F. Also available in following grades:

No. 20; nickel 35, chrome 18.

No. 18; nickel 25, chrome 16.

No. 2000; chrome 26-28, nickel 12-14.

No. 14; chrome 6, molybdenum .5.

All of these grades carry a high silicon content, varying from 1-2.5 per cent.

- - 3 4 - - - 8 - -
PYTHON—Allegheny Ludlum Steel Corp., Brackenridge, Pa. Carbon .85, vanadium .25. For chuck jaws, clutch pins and other parts requiring unusual wear and shock resistance. Water hardening.

See advertisement, Page 157

R

- - 3 - - 6 7 - - -
RANDALL—Randall Graphite Products Corp., Chicago. S.A.E. No. 64 bronze or as specified; furnished as sand castings. Resists corrosion caused by moisture resists heat to 700 deg F; high abrasion resistance; ts ult, 30,000 psi; medium ductility; good bearing properties; conductivity, good; Bhn, untreated, 80. For use as bushings, graphite-inserted in the perforated or drilled hole, grooved, or reservoir types.

RANIER—Ohio Ferro Alloys Corp., Canton, O. Ferro alloys for deoxidizing agents and for alloying in the production of iron and steel.

- - 3 4 - - - - - - -
RED ANCHOR—Anchor Drawn Steel Co., Latrobe, Pa. Carbon .95-1.1; commercial carbon drill rods. Strength varies from 70,000 psi annealed to 225,000 psi fully hardened; reduction in area when annealed, as high as 50 per cent. For precision shafts for motors, spindles, anvils, etc.

- 2 3 4 - 6 - 8 - 10
REDX ALUMINUM ALLOYS—National Smelting Co., Cleveland 5.

- - - 4 - - - - - - -
X-5; silicon 5.5, copper 1.5, magnesium .3, manganese .3 furnished in rough bars or billets for sand casting, die casting, and forging. Mechanical properties (as sandcast); ult ts, 32,000 psi; yield point, 20,000 psi; elongation, 1.5 per cent min; impact resistance, medium; endurance limit, 10,000 psi at 100 millions; Bhn, 80; sp gr, 2.69; nonmagnetic; heat-resistant to 300 deg F. For engine and motor castings, such as crankcase, cylinder blocks and heads, blower housings and rotors, etc.

- - - 4 - - - 8 - 10
X-8; silicon 8, manganese .3, magnesium .3, copper 1.5, remainder aluminum; furnished in rough bars or billets; for sand casting, die casting and forging. Mechanical properties (as sand cast): ult ts, 33,000 psi; yield point, 25,000 psi; elongation, 1 per cent; impact resistance, medium; Bhn, 70-90; sp gr, 2.69; nonmagnetic; weldability, good; heat-resistant to 350 deg F; abrasion resistance, medium. For internal combustion engine parts, cylinder heads, motorblocks, crankcases, transmission housings, etc.

- - 3 4 - - - 8 - -
X-10; silicon 10, magnesium .5, manganese .5, copper 1.5; furnished in rough bars or billets; for sand casting and die casting. Mechanical properties (permanent mold cast): ult ts, 36,000 psi; yield point, 33,000 psi; impact resistance, medium; Bhn, 95-105; sp gr, 2.69; nonmagnetic; weldability, good; heat-resistant to 400 deg F. For diesel and automotive pistons and similar bearing parts.

- 2 - 4 - 6 - - - -
X-13; copper 1.5, silicon .2, magnesium .5 and manganese .5; furnished in rough bars or billets and as permanent mold castings. Ult ts, 36,000 psi; yield point, 32,000 psi; impact resistance, low; Bhn, 90 min; sp gr, 2.68; nonmagnetic; weldability, fair; resists heat to 350 deg F; abrasion resistance, high; has low expansion. For diesel and automotive pistons.

The company produces most of the common aluminum alloys in ingot forms for casting, shotted, granulated and powdered aluminum and aluminum alloys, and magnesium and magnesium alloys, some of which were given above.

- - - 4 5 - - - - - -
REPUBLIC—Alloy Steel Div., Republic Steel Corp., Massillon, O. These alloy steels meet demands for material of lighter weight, greater strength, resistance to shock, impact and torsional strain, and high fatigue resistance; for severe service.

S-1 Nickel; a modification of S-1 with addition of 1.25-2.5 nickel for somewhat better physical properties than S-1.

FC; free machining grade of S-1 analysis; still 12-14 chromium. Machines nearly as well as screw stock. Fairly resistant to the atmosphere, organic and fruit acids, etc. Can be hardened by heat treatment up to about 400 brinell. Considerably more care and control required in forging operation than with S-1.

AA; chromium 14-18, carbon .12 max.; good corrosion resistance; heat resistant to 1500 degrees Fahr.; fabricating and welding properties inferior to 18-8; for bicycle automotive trim, oil burner parts, etc.

AA High Carbon; a variation of AA with capacity to heat treat to high physicals.

AA-FM; a free-machining codification of AA with machinability about 85-90 per cent of Bessemer screw stock.

HC; chromium 23-27; heat-resistant to 1900 deg F; not affected by sulphur gases; strength and creep at high temperatures not as good as the chromium-nickels.

18-23; chromium 18-23; high heat resisting properties; good resistance to scaling, but strength and creep lower than chromium-nickel types; for furnace parts, etc.

4-6 per cent; chromium 4-6 with several carbon ranges to .25 and with or without addition of molybdenum or columbium, titanium, aluminum and tungsten; additions of columbiun, titanium or aluminum practically eliminate air-hardening on welding; corrosion and heat resistance considerably superior to that of carbon steels, and with fair strength at high temperatures; for oil refinery and furnace parts.

1 - - 4 5 - - 8 - -
RESISTAC—American Manganese Bronze Co., Philadelphia 36, Pa. Three grades of aluminum bronze; available in sand castings, rods or bars and hammered forgings; strong; light; resisting certain acids and chemicals; retaining strength at high temperatures; and having excellent fatigue values. Composition and physical characteristics for each grade are given below:

1 - - 4 5 - - - - - -
Nos. 1 and 2; copper 85-90, aluminum 8-11, iron 4 max; ult ts, untreated, 65-80,000 psi; yield point, 28-35,000 psi; elongation in 2 in., 20-30 per cent; impact resistance, medium; Bhn, 120-150; sp gr, 7.78 (wt per cu in = 0.270 lb); nonmagnetic; weldability, fair; resists heat to 500 deg F; abrasion resistance, medium. Used for parts requiring high corrosion resistance, strength, and heat resistance, such as mill and valve guides; and for parts requiring good fatigue resistance.

1 - - 4 - - - 8 - -
No. 3; copper 80 (min), aluminum 8-10, iron 5 (max), nickel 5 (max). Can be heat-treated by quenching from 1600 deg F, drawn at 700-1000 deg F, increasing strength and hardness but lowering ductility. Mechanical properties in untreated state are: ult ts, 90,000 psi min; yield point, 42,000 psi; elongation in 2 in., 15 per cent; impact resistance, medium; Bhn, 185 min; sp gr, 7.78 (wt per cu in = 0.270 lb); practically nonmagnetic; weldability, fair. Heat resistant to 500 deg F; abrasion resistance, low. For parts requiring high corrosion resistance and strength, such as gears, mill guides, valve guides, etc.

See advertisement, Page 307

1 - - - 5 - - - 9 -
REVALON—Revere Copper & Brass Inc., New York 17. Copper 76, aluminum 2.25, arsenic .04, balance zinc; in tubing and plates. In fabrication, material can be brazed, soldered or welded. Resists corrosion caused by high velocity, salt or brackish waters. Abrasion resistance, medium; ts, ult, 55-80,000 psi; ductility, high; sp gr, 8.31; bearing properties fair. Used for condenser tubes for utility, oil refinery, marine, heat exchangers, etc.

- - - 4 - - - - - 9 -
REVERE—Revere Copper & Brass Inc., New York 17.

Magnesium; various alloys in sheets, strips, plates, rods, bars, forging stock, angles, channels, extruded shapes, seamless tubes and forgings.

Aluminum, various alloys in rods, bars, forging stock, angles, channels, extruded shapes, seamless tubes and forgings.

1 - 3 4 - - - - - -
REX Z METAL—Chain Belt Co., Milwaukee 4. Furnished as castings; resists corrosion caused by weather and inorganic acids to a degree; resists heat to 800 deg F; high abrasion resistance; ts, ult, 80,000 psi, medium ductility; sp gr, 7.45; good bearing properties; Bhn, untreated, 200. For cast parts requiring high strength and good machinability.

1 2 - - - 6 - - - -
REZISTAL—Crucible Steel Co. of America, New York. Stainless steels available in the following grades:

301; carbon over .08-.2, chrome 16-18, nickel 6-8, manganese 2 max.

KA2, Type 302; carbon over .08-.2, chrome 17-19; nickel 8-10, manganese 2 max.

2-C, Type 302B; carbon over .08-.2, chrome 17-19, nickel 8-10, silicon 2-3, manganese 2 max.

FM-188, Type 303; carbon .2 max, chrome 17-19, nickel 8-10, sulphur or selenium .07 min, molybdenum .60 max, manganese 2 max.

KA2S, Type 304; carbon .08 max, chrome 18-20, nickel 8-10, manganese 2 max.

KA2S-2010, Type 308; carbon .08 max, chrome 19-21, nickel 10-12, manganese 2 max.

No. 3S, Type 309S; carbon .08 max, chrome 22-24, nickel 12-15, manganese 2 max.

No. 7, Type 310; carbon .25 max, chrome 24-26, nickel 19-22, manganese 2 max.

No. 4, Type 311; carbon .25 max, chrome 18-20, nickel 24-26, manganese 2 max.

KA2SMO, Type 316; carbon .1 max, chrome 1618, nickel 10-14, molybdenum 2-3, manganese 2 max.

KA2ST, Type 321; carbon .1 max, chrome 17-19, nickel 8-11, titanium min 4 × C, manganese 2 max.

KA2SCB, Type 347; carbon .1 max, chrome 17-19, nickel 8-12, columbium 8 × carbon min, manganese 2 max.

Turbine, Type 403; carbon .15 max, chrome 11.5-13.

405; carbon .08 max, chrome 11.5-13.5, aluminum .1-.3.

406; carbon .15 max, chrome 12-14, aluminum 3.5-4.5.

No. 12, Type 410; carbon .15 max, chrome 11.5-13.5.

No. 122, Type 414; carbon .15 max, chrome 11.5-13.5, nickel 2.5 max.

FM2, Type 416; carbon .15 max, chrome 12-14, sulphur or selenium .07 min, molybdenum .6 max.

Gr. A, Type 420; carbon over .15, chrome 12-14.

420F; carbon over .15, chrome 12-14, sulphur or selenium .07 min, molybdenum .6 max.

No. 17, Type 430; carbon .12 max, chrome 14-18.

430F; carbon .12 max, chrome 14-18, sulphur or selenium .07 min, molybdenum .6 max.

No. 162, Type 431; carbon .2 max, chrome 16-18, nickel 2.5 max.

Gr. B, Type 440; carbon .60-.75, chrome 14-18.

Gr. B-80, Type 440B; carbon .75-.95, chromium 16-18.

Gr. B-100, Type 440C; carbon .95-1.00, chromium 16-18.

441; carbon over .2, chrome 14-18, nickel 2.5 max.

No. 20, Type 442; carbon .35 max, chrome 18-23.

No. 27, Type 446; carbon .35 max, chrome 23-30.

1 - - - 5 - - - - -
RIVERSIDE—Riverside Metal Co., Riverside, N. J. Phosphor bronze, nickel silver and beryllium copper in sheet, strip, wire and rod form.

- - 3 4 5 - - - - -
ROL-MAN—Manganese Steel Forge Co., Philadelphia. Furnished in rods or bars, wire,

sheets and plates, also hot forgings, stampings, wire cloth, welded and ground parts. Contains manganese 11-14; carbon 1.1-1.4; resists heat to 400 deg F; has high abrasion resistance; ts, 140-160,000 psi; compressive, 100,000; high ductility; nonmagnetic; Bhn, heat treated, 190-210; work-hardened, 325-500. Used where abrasion resistance and high strength are needed.

1 - - 4 5 - - - - -
ROMAN BRONZE—Revere Copper & Brass Inc., New York 17. Copper 60, tin .75, zinc 39.25; for forging, flanging, upsetting. Uses include piston rods, bearing applications.

1 2 - 4 - - - - - 10
RUSTLESS—Rustless Iron & Steel Corp., Baltimore 18. Numerous types of stainless steel grades for various requirements, including the following:

1 2 - - - - - - - 10
18-8 FM Sulphur, Type 303; carbon .20 max, manganese 2 max, phosphorus .15 max, sulphur or selenium .18-.35, chromium 17-19, nickel 8-10 and molybdenum .60 max; furnished in rough bars or billets, finished rods or bars, strips (coiled) and wire, for forging, cold upsetting or forming, turning, boring, etc. Anneals at 1800-2050 deg F, 10-30 minutes, water quench. Mechanical properties in annealed state: ult ts, 88,000 psi; yield point, 33,000 psi; elongation, 54 per cent; impact resistance, medium; Bhn, 155-175; sp gr, .29 lb per cu in.; nonmagnetic except when cold-worked; resists corrosion caused by all ordinary corrosive agents, domestic and industrial; heat resistant to 1650 deg F. For parts fabricated by machining and requiring heat and corrosion resistance.

1 2 - 4 - - - - - -
18-8, Types 302 and 304; with slightly varying analysis—Type 302 having over .08-.2 carbon, manganese 2 max, phosphorus .04 max, sulphur .04 max, silicon 1 max, chromium 17-19 and nickel 8-10; furnished in same form as above. Anneals at 1750-2050 deg F, 10-30 minutes, water quench. Mechanical properties in annealed state: ult ts, 85,000 psi; yield point, 30,000 psi; elongation, 60 per cent; impact resistance, high; Bhn, 140-160; sp gr, .29 lb per cu in.; heat-resistant to 1650 deg F; resists corrosion caused by all ordinary corrosive agents, domestic and industrial. For use where corrosion resistance is required.

12; Type 410; carbon .15 max, manganese 1 max, phosphorus .04 max, sulphur .04 max, silicon 1 max and chromium 11.5-13.5; furnished in same form as above. Hardens at 1700-1850 deg F, 15-45 minutes, oil quench. Mechanical properties in heat-treated state: ult ts, 75-195,000 psi; yield point 40-145,000 psi; elongation, 15-32 per cent; impact resistance, high; Bhn, 160-400; sp gr, .28 lb per cu in.; magnetic resists corrosion caused by neutral and basic salts, natural and mine water and steam; heat resistant to 1250 deg F. For pump rods, pistons, valve parts, screws, bolts, chutes, etc.

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12 FM, Type 416; carbon .15 max, manganese 1 max, phosphorus .04 max, sulphur .18-.35, silicon 1 max, chromium 12-14 and molybdenum .6 max; furnished in same form as above. Hardens at 1700-1850 deg F, 15-45 minutes, oil quench. Mechanical properties in heat treated state: ult ts, 75-195,000 psi; yield point, 40-145,000 psi; elongation, 11-28 per cent; Bhn, 160-400; sp gr, .28 lb per cu in.; magnetic; corrosion resistance similar to Type 410; abrasion resistance medium; heat resistance to 1250 deg F. For all parts fabricated by machining as valve parts, pump rods, carburetor parts, etc.

1 2 - 4 - - - - - -
17, Type 430; carbon .12 max, manganese 1 max, phosphorus .04 max, sulphur .04 max, silicon 1 max and chromium 14-18; furnished in same form as above. Anneals at 1450-1550 deg F in half-hour, air or water quench. Mechanical properties, ult ts, 70,000 psi; yield point 40,000 psi; elongation, 35 per cent; impact resistance, medium; Bhn, 140-165; sp gr, .28 lb per cu in.; magnetic; resists corrosion caused by atmosphere, salt spray, food products, nitric acid; heat resistant to 1550 deg F; abrasion resistance, medium. For exterior trim, equipment in food industry, etc.

See advertisement, Page 271

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1 2 - - - 6 - - - -
SABECO—Saginaw Bearing Co., Saginaw, Mich.
No. 5 bearing bronze; copper 69-71, tin 4.5-5.5, lead 24-26, max, impurities .2. For light or medium load and water lubricated bearings.

No. 9; copper 69-71, tin 8.5-9.5, lead 20-22, max, impurities .2. For heavy loads such as average machine tool requirements.

No. 11; copper 69-71, tin 10.5-11.5, lead 18-20, max, impurities .2. For high pressures.

No. 11HG; copper 69-71, tin 10.5-11.5, lead 18-20, max, impurities .2. For worm wheels, clutch shifter shoes, forging machine slides, and extreme heavy bearing conditions.

No. 16; copper 69-71, tin 15-16.5, lead 13.5-14.5, max, impurities .2. For friction rings, and heavy-duty boring spindle bearings.

See advertisement, Page 142

1 - 3 4 - - - - - -
SANDUSKY ALLOY IRON—Sandusky Foundry & Machine Co., Sandusky, O. Nickel, chrome and molybdenum cast iron alloys; furnished in tubing, centrifugal cast and in finished cylindrical parts; resists corrosion; high abrasion resistance; ts, 25-60,000 psi; Bhn, untreated, 160-300; heat-treated, 300-600. For rolls, sleeves, bushings, cylinders, etc.

1 - - 4 6 - - - -
SANDUSKY BRONZES—Sandusky Foundry & Machine Co., Sandusky, O. Bronze, brass and manganese bronze alloys; furnished in tubing, centrifugally cast and in finished cylindrical products; resists corrosion due to composition and superior structure; ts, 30-110,000 psi; good bearing properties; Bhn, 3-46 inches in diameter and up to 330 untreated, 40-250. Used for rolls, liners, sleeves, bushings, cylinders, pipe, tubes of inches in length.

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SATCO Bearing Metal—Magnus Metal Corp., Chicago. Lead-base alloy containing from 94-98 per cent lead, with balance tin, calcium and other auxiliary hardeners; melting point about 125 degrees higher than that of tin-base and lead-base babbitt metals, with higher resistance to deformation and wiping at elevated temperature. Material is furnished in ingot form and also lined bearings. Mechanical properties in untreated state; ult ts, 11-13,000 psi; compressive, 15-17,000; elongation, 8-12 per cent; Bhn, 22-24. Recommended as a lining for brass, bronze and steel back bearings. May be used as a substitute for lead and tin base babbitts, block tin and other bearing metals.

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SCOVILL—Scovill Mfg Co., Waterbury, Conn.

1 - - - - 6 7 - - -
A complete line of high and low brasses, phosphor-bronzes, nickel-silvers, and cupro-nickels for various mechanical, electrical and heat-exchanger purposes.

1 - - - - - - - - -
Free-cutting brass rod; copper 61, lead 3, zinc 36; in finished rods or bars, for hot forging, turning, boring, etc. Resists heat to 500 deg F; abrasion resistance, medium; ts, ult, 55-75,000 psi; ductility, medium; sp gr, 8.5; bearing properties, fair. Specially adapted to fabricating on high-speed screw machines.

1 - - - - 6 - - - 10
Hardware bronze; copper 89, lead 2, nickel 1, balance zinc; furnished in rods, bars and wire for turning, boring, etc; machinability, good; resists corrosion caused by atmospheric conditions; ts, 38-85,000 psi; sp gr, 8.85; bearing properties, good; recommended heat treatment, annealing, 1000-1100 deg F; Bhn, untreated, 48-125. Used for screw machine products.

1 - - - - - - - - -
Naval brass; copper 60, tin .75, zinc 39.25; in finished rods or bars, and tubing, for hot forging, welding, turning, boring, etc. Resists heat to 500 deg F; medium abrasion resistance; ts, ult, 60-90,000 psi; ductility, medium; weldability, fair; sp gr, 8.4. Used for boat shafting, turn buckles, rods, etc.

70-30 copper nickel; copper 70, nickel 30; furnished in tube form; resists corrosion due to organic acids and alkalies, sulphur compounds, salt and brackish waters; good resistance to abrasion or erosion; resists heat to 600 deg F; ts, 55-100 000 psi; recommended heat treatment, annealing 1100-1300 deg F; Bhn, untreated, 70-150. Used for condenser and heat-exchanger tubes.

Phosphor bronze; copper 92, tin 8; furnished in rods, wire, sheets and strips; for stamping, forming, turning, boring, etc, into machine parts; abrasion-resistant; electrical uses, bearing application. Excellent resistance to corrosion and fatigue. Ts, (sheet) 60-110,000 psi. For springs, diaphragms, bushings, etc.

1 - - 4 5 - - - - -
Phosphorized Admiralty tubes; copper 70, tin 1, phosphorus .03, zinc balance; in tubing; resists dezincification; resists corrosion caused by alkalies, weak acids, sulphur, petroleum compounds; resists heat to 500 deg F; abrasion resistance, high; ts, ult, (soft) 50,000 psi; ductility, high. For condenser tubing, particularly where dezincification is to be expected.

1 - 3 - 5 - - - - -
18 per cent nickel silver; copper 65, nickel 18, zinc 17; furnished in finished rods or bars, strips, wire and sheets; for turning, boring, stamping, and welding. Mechanical properties in untreated state; ult ts, 60-90,000 psi; nonmagnetic; resists corrosion caused by acids, mild alkalies, atmosphere, etc; abrasion resistance medium.

1 - - - - - - - - -
SEALMET — Allegheny Ludlum Steel Corp., Brackenridge, Pa. Typical analysis—chromium 27, iron balance. Alloys having same coefficient of expansion as certain grades of glass. For application where metal wires or strip must be attached directly to glass.

See advertisement, Page 157

- - - - - 6 7 - - -
SELFLUBE—Keystone Carbon Co., Saint Marys, Pa. Self-lubricating porous bronze and porous iron, bearings and sleeves; yield point for bronze, 12,090 psi; 30,000 psi min. 50,000 psi max, for iron; ductility high. For bearings, bushings, etc. Also bronze, brass and iron for structural parts.

See advertisement, Page 295

- - 3 4 - - - 8 - -
SEMINOLE—Allegheny Ludlum Steel Corp., Brackenridge, Pa. Carbon .45, chromium 1.3, tungsten 2, vanadium .25. For high creep strength bolts and studs for superheated steam; also machine parts having high wear and fatigue values. Withstands moderately elevated temperatures. May be oil hardened.

See advertisement, Page 157

1 2 - - - - - - - -
SHARON—Sharon Steel Corp., Sharon, Penna. Stainless and heat-resisting alloy. Chrome-nickel group 17.7, chromium 17, nickel 7, carbon .09-.20. Used for automotive trim, for deep drawing where straight-chromium types are not sufficiently ductile.

18-8; chromium 18, nickel 8, carbon .08-.20; specially suited to resist atmospheric erosion and corrosion. For dairy and chemical plant equipment, food, meat, processing machinery, high strength, lightweight structural members and for resisting the oxidation of elevated temperatures.

Alloy, steel, hot and cold-rolled strip steel, hot and cold-rolled sheet steel, Galvanite, galvanized, tin, terne and zinc coated strip and sheet, also available.

- - - 4 - - - - - -
SHENANGO-PENN—Shenango-Penn Mold Co., Dover, O. Centrifugal castings in all bronzes. Monel metals and alloy irons—a complete range of red bronze alloys, as well as yellow metals including manganese bronzes and aluminum bronzes. Also special alloys such as Monel metal, aluminum and silicon bronzes, copper, etc. Grades of plain and alloy iron, as well as Ni-Resist are available. Furnished in cast tubular bars or cylinders in sizes from 2-26 in. OD and to 26 ft in length; solid bars in diameters ranging from ½ to 8 in.—in standard 6 ft lengths. For immediate delivery stock of both solid and tubular bars under 6¾ in. OD is maintained. Extremely flexible, and can be adapted to any application where castings are used. Flanges and unusual shapes and sizes also available. For bearings, bushings, drums, liners, roll covers, sleeves, washers, rings etc.

See advertisement, Page 291

- - - 4 - - - - - -
SHIELD-ARC—Lincoln Electric Co., Cleveland. Type 85; high-tensile welding rod; recommended for fabrications of high-tensile steels; Bhn, 190-250.

Type 100; brinell hardness 235-300.

1-Corrosion resistant | 2-Heat resistant | 3-Abrasion resistant | 4-High tensile strength | 5-High ductility | 6-Bearing application | 7-Electrical uses | 8-Heat treating | 9-Low specific gravity | 10-Machinability

1 - - 4 5 - - - - - -
SHOCKPROOF—Lake City Malleable Co., Cleveland. Malleable iron of high tensile strength, high yield point and ability to withstand shock and abuse, possessing good machining qualities and resistance to corrosion: ult ts, 53-60,000 psi; yield point, 35-40,000 psi.

See advertisement, Page 316

1 2 - - - - - - 8 - -
SICROMO—Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.

1 2 - - - - - - - - -
Type 1; carbon .15 max, manganese .5 max, phosphorus .03 max, sulphur .03 max, silicon 1-1.4, chromium .75-1.25, molybdenum .45-.65; furnished in rough bars or billets, finished rods or bars, and tubing, for hot forging, welding, turning, boring, etc. Material is corrosion-resistant; heat-resistant to 1050 deg F; ts, ult, 60 000 psi min; fair weldability; and Bhn, annealed, 163 max. For use in oil refinery field.

1 2 - - - - - - 8 - -
Type 2; similar to above with slightly higher chromium content.

1 2 - - - - - - - - -
Type 2½; similar to Type 2 with slightly lower silicon content.

Type 3; similar to Type 2½, with slightly higher silicon and chromium content.

1 2 - - - - - - 8 - -
Type 5; similar to Type 3, with lower silicon content and higher chromium.

Type 5S; similar to Type 5, differing only in higher silicon content.

1 2 - - - - - - - - -
Type 7; similar to Type 5S, having lower silicon and higher chromium content.

1 2 - - - - - - 8 - -
Type 9; similar to Type 7, having higher chromium content. All above materials are for oil refinery use.

Type 7M; similar to Type 7, but having an increased molybdenum content.

Type 9M; similar to Type 9, but having an increased molybdenum content.

1 - - 4 5 - - - - - -
SIL-FOS—Handy & Harman, New York 7, Brazing alloy containing silver 15, copper 80, phosphorus 5; flows at 1300 deg F; furnished in rods, wire, sheets and strips (coiled); corrosion-resistant; high ductility; sp gr 8.45. Used to join nonferrous metals only, particularly copper, brass and bronze.

1 - 3 - - - - - - - -
SILFRAM—Stoody Co., Whittier, Calif. A cast hard-facing rod of chromium, nickel, silicon, carbon and iron; good bearing surface; excellent resistance to corrosion; can be machined with carbide tools: Rockwell C hardness 37-41. For hard-facing equipment subject to corrosion, abrasion and impact, such as pump sleeves, valves, etc.

1 2 - - - - - - - - -
SILMO—Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O. Carbon .15 max, manganese .5 max, phosphorus .04 max, sulphur .045 max, silicon 1.15-1 65, and molybdenum .45-.65; furnished in rough bars or billets, finished rods or bars, and tubing, for hot forging, welding, turning, boring, etc., into parts. Tensile strength, ult 55,000 psi, min; resists heat to 1000 deg F; fair weldability; Bhn, annealed, 163 max. For use in oil refinery field.

- 2 - 4 - - - - - - -
SMAVROC—The Medart Co., St. Louis. Alloy steel forgings for rolls for steel or nonferrous mill bar straighteners.

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SOFTWELD—Lincoln Electric Co., Cleveland. For arc welding cast iron where easy machinability is required.

- - - - 5 - - 8 - 10
SPEED CASE—Monarch Steel Co., Indianapolis, and affiliate, W. J. Holliday & Co., Hammond, Ind. A low-carbon, free-machining open-hearth steel (X1515) furnished in hot-rolled plate and bars, and cold finished bars. Typical analysis: carbon .20, manganese 1.25, sulphur .25, phosphorus, .04 max, silicon .07 max. Ts, 62-72,000 psi. Impact resistance at low temperatures and ductility equal to or better than SAE 1020. Machines readily, 200-250 SFPM (average). Case hardens rapidly with deep, uniform penetration. Has low hysteresis loss. Can be forged, cold-formed or rolled and welded. Widely used for machine tables.

- - - - 5 - - 8 - 10
SPEED-TREAT—Monarch Steel Co., Indianapolis and affiliated company, W. J. Holliday & Co., Hammond, Ind. A medium-carbon, free-machining open-hearth steel (X1545) furnished in hot-rolled plate and bars, and cold-finished bars. Typical analysis: carbon .45, manganese 1.30, phosphorus .04 max, sulphur .25, silicon .07 max. Ts, 90-100 000 psi. Machines 50 per cent faster than SAE 1045. Impact resistance at low temperatures and ductility equal to or better than SAE 1045. Can be satisfactorily heat-treated. Medium hardness and hardenability similar to that of SAE 1045. Can be forged and welded. Used for gears, welded power shovel dippers, bearing plates, etc.

- - - - - 6 7 - - -
SPEER—Speer Carbon Co., St. Marys, Pa. Carbon, electrographite, metal-graphite materials; in finished plates, bars, rods, for further machining. Not attacked except by oxidizing chemicals; starts to oxidize at 500 deg C; sp gr, 2 2.20; ts, 1000-4000 psi; crushing 2800-4500 psi. Used for contacts, bearings, molds, dies, seal rings, etc.

- - - - - - 7 - - -
STACKPOLE—Powders—Stackpole Carbon Co., St. Marys, Pa.

Silver-tungsten; for contacts for circuit breakers, relays, contactors, etc; Rockwell B, 85-90; sp gr, 11.4-15; weldability, good.

Silver-molybdenum; furnished in parts finished to size; Rockwell B, 80; sp gr, 10 3; weldability, good; for contacts for circuit breakers, relays, contactors, etc.

Iron powders; molded to close tolerances; used for gears, pole pieces for small motors, magnetic yokes, iron cores, also large parts and unusual shapes where much machining is ordinarily involved.

1 - - 4 - - - - - - -
STA-GLOSS—Jessop Steel Co., Washington, Pa.

A, type 420; stainless steel; ult strength, 230,000 psi; yield point, 220,000 psi; elongation in 2 in. 2½%; Bhn, 500. Used for gears, pump rods, etc.

B, type 440; stainless steel; ult strength, 280,000 psi; yield point, 250,000 psi; Bhn, 580. Used for engine parts, gages, etc.

C, type 440; stainless steel; ult strength, 310,-000 psi; yield point, 270,000 psi; Bhn, 600. Used for valve seats, bearings, etc.

- - - 4 - - - - - - -
STAINWELD—Lincoln Electric Co., Cleveland. Coated, electrode for welding stainless steels or building up surfaces to resist corrosion.

Type A-5; for large number of so-called 18-8 stainless steels. Welds are of high tensile strength and ductility and possess same resistant qualities as the parent metal. Contains suitable amount of columbium to prevent intergranular corrosion of deposited metal.

Type A-7; for stainless steels of 18 per cent chromium, 8 per cent nickel type; fast-flowing, smooth operating. Especially adapted for surfacing other steels with minimum admixture of base metal.

Type B; for arc welding stainless steel with chemical content of approximately 25 per cent chromium and 12 per cent nickel. Physical properties equal to metal welded.

Type C; a modification of the well-known 18-8 analysis, commonly known as 18-8 SMO (approx 3½ molybdenum). Suitable for welding stainless steels of Types 316-317 (Iron and Steel Institute).

Type D; for stainless steels of 25 per cent chromium, 20 per cent nickel types; also for welding stainless steels to mild steel and for welding steels which are air-hardened and cannot be heat treated after welding.

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STANDAD Tubing—Standard Tube Co., Detroit 3. Electric welded steel tubing and fabricated tubular parts for mechanical, pressure and structural applications. Available in a wide variety of shapes and sizes.

See advertisement, Page 269

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STANNUM BABBITT—Lumen Bearing Co., Buffalo 12. Tin base bearing babbitt.

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STERLING Stainless Steels—Firth-Sterling Steel Co., McKeesport, Pa.

1 - 3 4 - - - - - - -
Type A (420); carbon .35, chromium 13.5; corrosion-resistant; ts, 240,000 psi; for automotive parts subject to wear. Good physical properties in heat-treated state; maximum resistance to corrosion secured by hardening and thorough grinding.

1 - - 4 - - - - - - -
Type T (410); carbon .10, chromium 13; possesses maximum strength and elasticity without sacrifice of toughness, machinable and corrosion-resistant. For pump rods, shafts, valve parts, gun barrels, pistons and machinery parts where strength is of greater importance than ease of machining.

1 - - 4 - - - - - - -
Type TX (403); modified Type T used for turbine blading.

1 - - 4 5 - - - - - -
Type FC (416); free-cutting stainless steel wherein a slight sacrifice in physical properties and corrosion resistance is made to obtain easier machining. For machine parts including screws, bolts, nuts, pump shafts, valves and spindles.

Type M (430); soft ductile steel that does not work-harden readily. Requires no heat treatment to secure corrosion resistance.

Type BHH (440-C); for bearings. Extremely hard and resistant to abrasion.

1 - - 4 5 - - - - - -
Types 18-8 (302), 18-8-S (304), and 18-8-FC (303); chrome-nickel group containing approximately 18 per cent chromium and 8 per cent nickel with various modifications or additions to give special physical properties, machinability or resistance to certain corrosive action. The free-cutting type can be easily machined, and cold work-hardened wire and strip have great strength and resiliency.

- 2 - - 5 - - - - - -
STERLOY—Sterling Alloys Inc., Woburn, Beston. Alloy castings available in several grades for various requirements, some of which are included below:

No. 2 (60/12); nickel 58-62 and chromium 10-14. As cast, yield strength, 30-40,000 psi; ts, 60-75,000 psi; elongation in 2 in., 2-5 per cent; temp, 1000-2250 deg F. Available for lead, salt, cyanide pots, rotary and stationary retorts, carburizing boxes, covers, tubes, trays, grids, racks, etc. Also for heat shock applications, hearth plates, rolls, etc.

No. 4 (35/15); nickel 33-37 and chromium 13-16. As cast, yield strength, 35-50,000 psi; ts, 60-75,000 psi; elongation in 2 in., 4-6 per cent. Commonly used for furnace conveyor mechanisms, rolls, rails, pier caps, chain, belts shoes, screw conveyors, hangers and combustion tubes.

No. 6 (25/12); nickel 10-14 and chromium 24-26. As cast, yield strength, 40-50,000 psi; ts, 80-100,000 psi; elongation in 2 in., 10-18 per cent. Used where castings are exposed to sulphur conditions, such as in oil-fired fuel, and also valves, fittings, pump parts, oil refinery tubes, tube supports, stoker parts, carrier blades, dampers, etc.

No. 9 (28/3); nickel 3 and chromium 27-30. As cast, yield strength, 35-45,000 psi; ts, 40-55,000 psi; elongation in 2 in., 1 per cent. For applications high in sulphur such as rabble arms, chemical industry parts, and high-speed salt pots using barium chloride as base.

No. 10 (18/8); nickel 6-10 and chromium 16-20. Properties after 48 hours at 1600 deg F: yield strength, 30-45,000 psi; ts, 80-95,000 psi; elongation in 2 in., 40-60 per cent. Limited use up to 1300 deg F where strength is not main requirement. Also for pumps, valves, fittings in chemical, rayon, synthetics and gasoline industry. When alloyed with columbium, titanium, etc., it withstands intergranular corrosion. Castings must be heat-treated for corrosion resistance. For mixing equipment in food industry, for attack of acetic, lactic, citric and tartaric acids.

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STOODEX—Stoody Co., Whittier, Calif. A cast hard-facing rod of chromium, cobalt tungsteel, carbon and iron; can be applied very smooth and thin; requires minimum of grinding; used where smooth, thin deposits are required, also where parts are subject to abrasion and impact such as plow moldboards, clutch fingers, expeller parts, etc.

1 2 3 - - - - - - -
STOODITE—Stoody Co., Whittier, Calif.

- - 3 - - - - - - -
Cast hard-facing rod composed of chromium,

1-Corrosion resistant | 2-Heat resistant | 3-Abrasion resistant | 4-High tensile strength | 5-High ductility | 6-Bearing application | 7-Electrical uses | 8-Heat treating | 9-Low specific gravity | 10-Machinability

manganese, zirconium, silicon, carbon and iron; makes excellent bearing surface; resists galling and pitting; Rockwell C hardness, 54-58. Used for hard-facing parts abraded by attrition or sliding friction; equally successful for hard-facing parts abraded by earth such as plow shares or other metals such as steel mill guides.

1 2 3 - - - - - - - -

Types 45, 54, 63; a series of special alloys ranging in physical properties from extreme toughness to extreme hardness. Rockwell C hardness is indicated by numbers. Used chiefly on lathes, coilers, boring mill tools, lathe centers, hot punches, blanking dies, thread gages, etc.

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STOODY—Stoody Co., Whittier, Calif.

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Type A.C.; a rod of high-carbon steel core and coating containing alloying elements principally chromium, manganese, silicon, carbon and iron; can be forged; Rockwell C hardness, 53-56; for hard-facing all types of equipment subject to abrasion and impact where applications must be made by alternating current machines.

Self-hardening, a fabricated hardfacing rod of chromium, manganese, silicon, molybdenum, carbon and iron; forms excellent bond with manganese steel; can be forged; Rockwell C hardness, 52-54; used chiefly for hard-facing crusher bucket lips and other equipment subject to abrasion and impact.

1 2 3 - - - - - - - -

Stoody 1; cast hard-facing rod composed of cobalt, chromium, tungsten; has high resistance to corrosion and abrasion; retains hardness, wear-resistance at red heat; Rockwell C hardness, 54. Used for hard-facing wood saw teeth, underreamer lugs, carbon scrapers, wire guides, pump sleeves, etc.

Stoody 6; cast hard-facing rod composed of cobalt, chromium and tungsten; has high resistance to abrasion and corrosion; retains hardness and wear resistance at red heat, Rockwell C hardness 41-43. Used for high-pressure, high-temperature steam valves, hot trimming dies, exhaust valves and valve seats.

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Tube Borium; a rod made of various screen sizes of irregularly shaped particles of cast tungsten carbide contained in steel tubes; high wear resistance; will cut nonmetallic substances; hardness 9-10 on Moh's scale, deposits being heterogeneous. Used on earth-working equipment, drilling and scraping operations, also for hard-facing.

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STRAINFREE ELASTUF PENN (Coldfinished)—Horace T. Potts Co., Philadelphia. Steel of manganese type without chromium, furnished in finished rods or bars; ts, 140,000 psi; medium ductility; nondistorting; high physicals; cold finished; Bhn, untreated 269. Used for parts whose length exceeds cross-sectional dimension as gears and worms with integral shafts, and feed and lead screws.

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STRESSITE—Chrysler Corp. Amplex Div., Detroit 31. Bronze, copper, iron and Super-Oilite powder metals of high density. For use as machine parts, eliminating costly machining operations.

- - 3 4 - - - - - -

STRESSPROOF—La Salle Steel Co., Hammond, Ind. A modified SAE X1340 steel in finished bars for machining; yield point 100,000 psi and 90,000 depending upon the size. Requires no heat treating but has replaced carbon and alloy carburizing and heat-treated steels. Used for worm gears, lead screws, spindles, shafts and speed reducers.

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SUMET—Sumet Corp., Buffalo. High-leaded bronzes as follows:

SM-4; lead 26-29 per cent. For high-speed and light-duty service.

SM-8; lead 24-27 per cent. For moderate speed and general service; suitable for machine tool bearings.

SM-10; lead 22-25 per cent. For general applications such as aeronautical engines, clutch cones and disks, compressors, connecting rods, crank pins, etc.

SM 12; lead 20-23 per cent. For cone and gyratory crushers, crane and ore machinery, mining machinery, etc.

SM 16; lead 19-21. For heavy-duty service such as crane motor compressor, dredging machinery, etc.

SM 18; lead 16.5-18.5 per cent. For crosshead pins, cranes, railroad, steam shovel, etc.

SM 14; lead 12-15 per cent. For thrust bearings, gears etc.

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SUMMERILL—Summerill Tubing Co., Bridgeport, Pa. Seamless tubing in practically all regularly used carbon grades from SAE 1010 to SAE 1095. Others are chrome molybdenum SAE 4130X, 4140, 4150, 4185, 52,100, 4340, NE-8630, NE-8635, nickel-silver, pure nickel-silver, corrosion-resistant steels —18-8, 16-13-3 and similar grades; 4 to 6 per cent chrome with ½ moly; also some of 12-14 per cent chrome, beryllium copper K-Monel and Invar. Available in any shape, and in sizes ranging from .012-in. to 5½ in. OD. Used for mechanical specialties, aircraft, industrial control instruments, fuel injection tubing for diesel engines, etc.

Also tapered and formed tubes for many special parts.

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SUPERIOR Copper Steel—Superior Metal Co. Chicago. Corrosion-resistant steel electro-copper-plated; in sheets and coiled strips for stamping and welding; resists corrosion caused by moisture; resists heat to 1400 deg F, in controlled oxidation; abrasion resistance, medium; weldability, fair. Used to substitute for solid copper sheet and strip.

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SUPERIOR Magnesium—Superior Bearing Bronze Co. Inc., Magnesium Div., Brooklyn 22. Magnesium castings for specific requirements.

See advertisement, Page 260

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SUPERIOR Prefinished Strip Steel—Superior Metal Works, Chicago 38. Strip steel, prefinished, offered in the following types: Zincsteel, Chromsteel, Nickel Steel, Brass Steel, Copper Steel. Zincsteel used in electronic and aircraft industry, while the others are used in washing machines, automobiles, etc.

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SUPERIOR Seamless Tubing—Penn Brass & Copper Co., Erie, Pa. Seamless brass and copper tubing from 5/64-in. OD x .010-in. wall, to and including 1-in. OD x .072-in. wall; both in copper of pure electrolytic mixture and in brass on 3 alloys, namely; 70/30, 2-1 leaded, and 85/15.

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SUPERIOR Stainless Steel—Superior Steel Corp., Carnegie, Pa. Hot and cold-rolled strip steel and stainless steels in all grades and analyses.

1 2 - - 5 - - - - -

301; chromium 16-18, nickel 6-8, carbon .09-.2; in coils for strips for stamping and welding; ult ts, (annealed), 95-110,000 psi; impact resistance, high; nonmagnetic; weldability, good. Used for trim, wearing plates, parts where strength is needed, airplane parts, etc.

302; chromium 17-19, nickel 8-10, carbon between .08-.2; in coils, strips for stamping and welding; in heat-treated state, ult ts, 90-95,000 psi; yield point, 30-40,000; elongation 55-65 per cent; impact resistance, high. For use same as type 301.

321 and 347 titanium and columbium stabilized stainless steels are also available.

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410; chromium 11.5-13.5, carbon .15 max. annealed; in coils or strips for stamping and welding. Ult ts, 60-75,000 psi; yield point 35-45,000; abrasion resistance, high; for plates, brackets, etc.

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430; chromium 14-18, carbon .12 max.; in coils or strips for stamping and welding; ult ts, 70-80,000 psi; yield point 45-55,000; heat resistant to 1500 deg F; abrasion resistance, high. For wearing plates, bright parts trim, etc.

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SAE X4130; carbon .27-.33, manganese .4-.6, phosphorus .04-.05 max, chromium .8-1.1, and molybdenum .15-.25; in coils or strips for stamping and welding; ult ts, 90,000 psi; yield point, 70,000 min; elongation in 2 in., 10-20 per cent; weldability good. For highly stressed or critical parts as aircraft work.

Also materials fulfilling requirements of government specifications AN, QQ-S-772, AN, QQ-S-757 and U. S. Navy 47-S-20. Hot and cold rolled strip steel, high carbon, low carbon alloys, including X4130 and Nitralloy.

See advertisement, Page 309

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SUPERIOR Strip Steel—Superior Metal Co., Chicago 38. Brass and copper-coated cold-rolled strip steel, furnished in coil form; magnetic, low abrasion resistance.

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SUPERMAL—The Jeffrey Mfg. Co., Columbus, O. Total carbon 1.60-1.80, manganese .20-.40, silicon .90-1.10; furnished as castings; heat-treated; ts, 60-70,000 psi; yield point, 50-60,000 psi, elongation in 2 in., 8 to 6 per cent; Bhn, 179-201. For chain links, buckets, conveyor equipment, etc.

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SUPERSTRIP—Acme Steel Co., Chicago. Hot and cold-rolled strip steel; furnished in sheets and strips (coiled) for stamping into parts. Material is furnished to specifications and is available in most sizes from ¼ to 22 in. in width and in thickness from ¼-inch and less.

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SUPERTEMP—Bethlehem Steel Co., Bethlehem, Pa. A patented alloy steel having high strength at high temperatures. Suitable for bolts and studs for reaction chambers, cracking stills, superheaters, etc.

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SURFACEWELD—Lincoln Electric Co., Cleveland. A fine-grained alloyed powder for application with the carbon arc. Gives smooth abrasion resisting surface. Can be applied in thin layer. Properly applied, coating will have a hardness of 54 Rockwell C. Maintains hardness and resists scaling at high temperatures. Corrosion resistance comparable to stainless steel.

1 2 - - 5 - - - - -

SUVENEER—Superior Steel Corp., Carnegie, Pa. Steel clad on one or both sides with stainless, copper, and some copper base alloys, etc.; furnished in strips; for stamping, welding, deep drawing, rolling, spinning, soldering, etc. Mechanical properties in annealed state: Ult ts, 50,000 psi; yield point, 35,000 psi; elongation, 30 per cent; Bhn, 50-60; magnetic. For bearing applications and electrical uses.

See advertisement, Page 309

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TALIDE—Metal Carbides Corp., Youngstown, O. Tungsten carbide metal; resists corrosion due to high tungsten content; heat-resistant to 2000 deg F; high abrasion resistance; ts, 300,000 psi; sp gr, 14.1; Bhn, untreated, 130 and over. For use as wear plates and guides, cutting tools, drawing dies and bushings.

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TALON—Steel Tube Div., Talon Inc., Oil City, Pa. Electric resistance welded carbon steel tubing for both pressure and mechanical applications. Available in sizes from ⅝-in. to 4 in. OD, and in lengths up to 40 ft.

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TAMCO—Titanium Alloy Mfg. Co., Niagara Falls, N. Y. Alloys including original high and medium carbon ferro carbon-titanium, foundry ferro-titanium, and several varieties of low-carbon ferro-titanium for rolled, cast and forged steels, stainless and alloy steels, and gray cast iron.

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TAWILCO—Taylor-Wilson Mfg. Co., McKees Rocks, Pa. Iron base casting; responds to heat treatment for hardening or strengthening, will also flame-harden well. Mechanical properties in untreated state: Ult ts, over 50,000 psi; compressive, 165,000; yield point, 45,000 psi; elongation .1 per cent; impact resistance, low; endurance limit (completely reversed bending), 20,000 psi; Bhn, 174-500 depending on grade; sp gr 7.01-7.5; magnetic; weldability, fair; heat-resistant to 1500 deg F; abrasion resistance,

1-Corrosion resistant
2-Heat resistant
3-Abrasion resistant
4-High tensile strength
5-High ductility
6-Bearing application
7-Electrical uses
8-Heat treating
9-Low specific gravity
10-Machinability

high. For all machine parts requiring strength, dampening capacity, rigidity, wearing properties, etc.

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TELNIC BRONZE—Chase Brass & Copper Co., Waterbury 91, Conn. Copper 98.3, nickel 1.0, phosphorus .02; tellurium .5. A hard high-strength forgeable, age-hardenable, machinable bronze for general engineering and structural uses.

1 - - 4 - - - - 8 - -
TEMPALOY—American Brass Co., Waterbury, Conn. Copper-aluminum-nickel alloys which respond to heat treatment; abrasion resistant. Uses include motor boat shafting, piston rods, bearing applications, etc.

See advertisements, Pages 279-282

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TENUAL—The National Bronze & Aluminum Foundry Co., Cleveland. Unmachined sand and permanent mold aluminum castings.

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THERMALLOY—The Electro-Alloys Co., Elyria, O. Nickel-chromium material; weight density, .3 lb. per cu. in.; heat-resistant to 1900 deg F.

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THOMASTRIP—Thomas Steel Co., Warren, O. Cold-rolled strip steel, bright finish uncoated and electro-coated in brass, bronze, nickel, zinc, tin and copper.

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TIGERLOY—Massillon Steel Casting Co., Massillon, O. Nickel-molybdenum; for shovel castings, gears, crane track wheels, castings for impact resistance, etc.

. - 3 4 5 - - - - - -
TIMANG—Taylor-Wharton Iron & Steel Co., High Bridge, N. J. Manganese nickel steel; plate, and rods; can be rolled, drawn, forged or shaped; for liners, wearing plates, screen cloth, welding rod, etc.

1 2 - 4 - - - - 8 - -
TIMKEN—Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.

. - - 4 - - - - 8 - -
Type 17-22A; carbon .3-.35, manganese .5 max, chromium 1-1.5, molybdenum .45-.65, vanadium .25-.35, in rough bars or billets, and finished rods or bars; for hot forging, turning, boring, etc. Heat-resistant to 1200 deg F.; ts, ult, 200,000 psi, min, heat-treated; medium ductility; Bhn, untreated 200; heat-treated, 470 max. Used for bolts, studs and other highly stressed parts at elevated temperatures.

1 2 - - - - - - - - -
Type 18-8; carbon .07 max, manganese .2-.7, silicon .75 max, chromium 17-20, nickel 8-10. This austenitic nonmagnetic alloy shows very good combination of creep and rupture strength, oil corrosion resistance, and oxidation resistance for service to 1500 deg F.

1 2 - - - - - - - - -
Type 16-13-3; carbon .13 max, manganese 1.5 max, chromium 15.5-17, nickel 12.5-14.5, molybdenum 2.5-3.25. This molybdenum modification possesses higher creep and rupture strength than the standard 18-8 analysis and is also more resistant to certain types of corrosion, especially those associated with pitting.

Type 4-6 Cr.Mo.; carbon .15 max, manganese .5 max, silicon .5 max, chromium 4-6, molybdenum .45-.65. For service to 1200 deg F, where corrosion resistance to hot petroleum products is a primary requirement. Inferior in its oxidation and corrosion resistance to Sicromo 5S.

. 2 - - - - - - - - -
Type .5 Mo. Steel; carbon .1-.2, manganese .3-.6, silicon .5 max, molybdenum .45-.65. For temperatures to 1000 deg F, the satisfactory creep strength allows for greater safety than can be obtained from carbon steel. The oxidation and corrosion resistance, however, is similar to that of carbon steels.

. - 3 4 5 - 7 - - -
TISCO—Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

Manganese steel castings for shock and abrasion resistance. Used primarily as wearing parts for mining, excavating, crushing and conveying equipment.

Carbon steel castings, low-alloy steel castings. Alnico and related magnet alloys.

1 - - - - - - - - - -
TITAN—Titan Metal Mfg. Co., Bellefonte, Pa. Bronze; flows at 1617 deg F, is low fuming and has been doubly deoxidized.

Naval Bronze; flows at 1615 deg F.

Wearwell; flows at 1593 deg F. A special purpose rod possessing great hardness. Rods are not furnished under ¼-in. diam.

These rods are tin bronzes and work well on cast iron; have good hardness, a fair amount of ductility and a good corrosion resistance.

Manganese Bronze; flows at 1617 deg. F., is low fuming and has been doubly deoxidized.

Naval Manganese Bronze; flows at 1620 deg F.

The above two welding rods contain iron, manganese, nickel, etc., in addition to tin. Good general-purpose rods, specifically recommended for cast iron; produce rigid welds; able to withstand distortion.

1 - - 4 5 - - - - - -
TOBIN BRONZE—American Brass Co., Waterbury, Conn. Copper 60, zinc 39.25, tin .75; abrasion-resistant. Uses include piston rods, boat shafting, condenser head plates, welding rods, seamless tubes, etc.

See advertisements, Page 279-282

1 - 3 4 5 - - 8 - -
TOLEDO ALLOY—Unitcast Corp., Steel Casting Div., Toledo, O.

- - 3 - - - - 8 - -
No. 4; abrasion-resistant silicon-molybdenum steel with good hardening properties; used for mining tools, wear plates, crusher plates and pinions.

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No. 6; air-hardening die steel of uniform machining qualities; long life under severe wear.

- - 3 - 5 - - 8 - -
No. 131; carbon .22-.28, manganese .7-.8, copper 1-1.2, vanadium .04-.08, silicon .4-.5, furnished in castings; tensile strength, 90-100,000 lb per sq in.; high ductility; for use where high strength and ductility are required and when hardness is of lesser importance.

1 - - 4 5 - - - - - -
No. 135; carbon .35-.45, manganese .70-.80, nickel .85-.95, chrome, .55-.65, and molybdenum .18-.25. Furnished as castings; will meet 4B, 4C2, 4C3 Army specifications. Can be oil or water quenched. General specification: Ts, 100,000 psi; ductility high; Bhn, 217-241. Good machinability.

See advertisement, Page 267

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TOMBASIL—Ajax Metal Co., Philadelphia 23. Material available in two grades.

A; copper 81.5; silicon 4.8, zinc 13.7. In untreated state mechanical properties are: ult ts, 65,000 psi; yield point, 40,000 psi, elongation, 15 per cent; Bhn, 140; sp gr, 8.25; nonmagnetic; weldability, good.

Navy; analysis in accordance with Navy Dept. Spec. 46B28—copper 90, silicon 5 max, zinc 5; in untreated state, ult ts, 55,000 psi; yield point, 20,000 psi; elongation, 40 per cent; Bhn, 105; sp gr, 8.25; nonmagnetic weldability, good.

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TONCAN IRON—Republic Steel Corp., Cleveland 1. An open-hearth iron alloyed with .4 min. copper and .07 min. molybdenum; resists corrosion caused by atmosphere, water, oils and process materials; tensile strength, 48-58,000 lb. per sq. in. min.; compressive strength 40,000; brinell hardness 90-120; for housing, piping, tubing, etc.

1 2 3 - - - - - - -
TOOLWELD—Lincoln Electric Co., Cleveland.

Type 60; coated arc welding electrode, deposited hardness of 60-65 Rockwell C; hardness retained to 1000 deg F; deposit can be heat treated same as high-speed steel. For building hard, tough cutting edges on cold-rolled steel and for other applications requiring super-hardness.

Type 55; for making metal-cutting edges where shock is encountered (for cutting tools, blades and dies) providing an as deposited weld metal hardness without heat-treatment of 55-60 Rockwell C. While not quite as hard as Type 60, it is somewhat tougher and more shock resistant. Otherwise, properties are essentially the same as type 60.

1 2 - - - - - 7 - - -
TOPHET—Wilbur B. Driver Co., Newark, N. J.

Type A; approximately 80 per cent nickel and 20 chromium; resists heat to 2100 deg F. Supplied in wire and strip form for electrical heating applications.

Type C; nickel 60, chromium 15, and balance iron; resists heat to 1800 deg F. Supplied in wire and strip form; for electrical resistance and heating application.

- 2 3 4 - - - - - - -
TRANTINYL—Youngstown Alloy Castings Corp., Youngstown, O. Furnished as sand castings. High abrasion resistance; medium ductility; high tensile strength. Used for tools for tube and bar mills such as guide shoes, plugs, guides, etc.

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TRODALOY—General Electric Co., Schenectady, N. Y. Resistance welding electrode alloys available in two grades.

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No. 1; cobalt 2.6, beryllium .4, and copper 97; has 55 per cent conductivity of copper. Mechanical properties in heat-treated state: ult ts, 90-120,000 psi; impact resistance, high; Bhn, 220. For resistance welding electrodes, soldering iron tips, springs, bushings, castings, brake drums, etc. No sales made through General Electric Co. Various trodaloy items sold through following licensees: P. R. Mallory Co., Ampco Metal Co., Wilbur B. Driver Co., Electroloy Co. and Welding Sales & Enginering Co.

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No. 7; generally consists of beryllium .1, chromium .4 and copper 99.5; furnished in rough bars or billets, finished rods or bars, wire, strips, plates for hot forging, stamping, extruding, turning, boring and as sand castings. Mechanical properties in heat-treated state: ult ts, 45-70,000 psi; impact resistance, high; endurance limit (completely reversed bending), 18-25,000 psi; Bhn, 90-140; nonmagnetic. Used for resistance welding electrodes, high conductivity springs and castings, and substitute for P-bronzes.

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TRUALOY—True Alloys Inc., Detroit.

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Copper; has high conductivity; castings for welding machines and conduction of current.

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Bearing bronze; low friction and wear, with high compressive strength; resistant to pounding and easy to machine.

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Aluminum; castings possessing high tensile strength, hardness and lightness.

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Aluminum bronze; for sand castings having corrosion resistance, and tensile strength of 65,000 psi. Recommended for parts subject to strain and wear.

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TRUFLEX Thermostat Metals—General Plate Div., of Metals and Controls Corp., Attleboro, Mass. Available in sheets or strips in long lengths, flattened and coiled, or cut to length—spiral, helix or double-helix coils—also fabricated parts, and welded or riveted sub-assemblies with solid-silver or laminated electrical contacts or mounting brackets. For control or indication of temperature and for compensating movement required in assemblies due to changes in temperature.

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TUBELOY—American Smelting & Refining Co., New York. Carbon .02, magnesium .02, tin .25, balance lead; tubing for extruding. Mechanical properties in untreated state: ult ts, 4500 psi; elongation, 15 per cent; impact resistance, medium; endurance limit (completely reversed bending), 1500 psi; Bhn, 9; sp gr, 11.33; weldability, fair; resists corrosion caused by water, gasoline, etc.; abrasion resistance, low. Used for conveying water, oil and other types of liquids.

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TUFTEST—The Medart Co., St. Louis. Cast iron for parts subject to excessive abrasion such as guiding disks; machinability, good.

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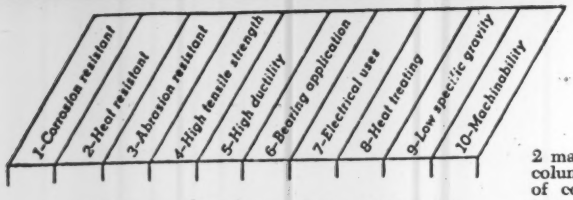
TY-LOY—W. S. Tyler Co., Cleveland. Special composition metal resistant to abrasive action. Wire screens of this material with-



stand severe abrasive conditions. Many sizes of square mesh can be made by Ty-Loy.

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U-LOY—Republic Steel Corp., Cleveland 1. Copper-bearing steel with good corrosion resistance, available in hot-rolled and galvanized sheets.

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ULTRA-CUT—Bliss & Laughlin Inc., Buffalo. High sulphur bessemer screw stock furnished in cold finished bars. For miscellaneous automatic screw machine parts.

See advertisement, Page 306

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UNION—Union Drawn Steel Div., Republic Steel Corp., Massillon, O.

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Freecut; carbon .08-.13 max, manganese .6-.9, phosphorus .09-.13, sulphur .16-.23; a free-cutting bessemer type steel.

Supercut; high-sulphur bessemer type; carbon .08-.13 max, manganese .6-.9, phosphorus .09-.13, and sulphur .24-.33.

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UNIVAN—Union Steel Casting Div., Blaw-Knox Co., Pittsburgh. Nickel-vanadium alloy; ts, 90,000 psi; for locomotive frames, crossheads, coupling boxes, driving wheel centers, etc.

1 2 3 4 5 - 7 8 - -
U. S. S.—United States Steel Corp., subsidiaries, including American Steel & Wire Co., Carnegie-Illinois Steel Corp., Columbia Steel Co., National Tube Co., Tennessee Coal, Iron & Railroad Co., and Tubular Alloy Steel Corp.

1 2 - 4 - - - - - -
Type 302, U. S. S. 18-8; carbon over .08-.2, chromium 17-19, nickel 8-10; resists heat to 1650 deg F, high abrasion resistance; atmospheric and acid-resistant. Ts, ult, 80-95,000 psi annealed, 105-300,000 psi, cold worked; high ductility; weldability, good; Bhn, annealed, 135-185. For food processing and chemical equipment, etc., fabricated by other than welding.

1 2 - - 5 - - - - -
Type 303, U. S. S. 18-8 F. M.; carbon .2 max, manganese 2.0 max, sulphur or selenium .07 min, molybdenum .6 max, silicon 1.0 max, chromium 17-19, nickel 8-10; resists heat to 1600 deg F; high abrasion resistance; ts, ult, 80-95,000 psi; high ductility; Bhn, untreated, 135-220. For nuts, bolts, valve parts, and shafting.

1 2 - 4 - - - - - -
Type 304, U. S. S. 18-8-S; carbon .08 max, chromium 18-20, and nickel 8-10; similar to Type 302; abrasion-resistant; high ductility. Used where corrosion resistance is desired after fabrication by welding.

1 2 3 - - - - - - -
Type 309, U. S. S. 25-12; carbon .2 max, manganese 2 max, phosphorus .04 max, silicon 1.0 max, chromium 22-24, nickel 12-15. Corrosion and heat-resistant; high abrasion resistance; ts, ult, 90-110,000 psi high ductility; Bhn, untreated, 150-185. For high temperature service, 2100 deg F max.

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Type 316, U. S. S. 18-8 Mo.; carbon .1 max, manganese 2 max, phosphorus .04 max, silicon 1.0 max, chromium 16-18, nickel 10-14 max, molybdenum 1.75-2.50. Corrosion and heat-resistant; high abrasion resistance, ts, ult, 80-95,000 psi; high ductility. For chemical and food equipment.

1 2 - 4 - - - - - -
Type 321, U. S. S. 18-8-Ti.; carbon .1 max, chromium 17-19, nickel 8-11, silicon 1.0 max, manganese 2 max, phosphorus .04 max, titanium four times actual carbon minimum; addition of titanium prevents susceptibility to intergranular corrosion. Ts. 80-95.000 psi; high ductility; abrasion-resistant. For high temperature service and where welded parts are subject to corrosion.

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Type 347, U. S. S. 18-8 Cb.; carbon .1 max, chromium 17-19, nickel 9-12, manganese 2 max, phosphorus, .04 max, silicon 1.0 max, columbium 8 times carbon min; addition of columbium prevents susceptibility to intergranular corrosion. Ts, ult, 80-95,000 psi; high abrasion resistance. For high temperature service and where welded parts are subject to corrosion.

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Type 410, U. S. S. 12; carbon .15 max, manganese 1.0 max, phosphorus .04 max, sulphur .04 max, silicon 1.0 max, chromium 11.50-13.50. Corrosion and oxidation resistant. Responds to heat treatment and can be modified by addition of columbium, aluminum and molybdenum for specific application. Ts, ult, 65-85,000 psi annealed, 100-200,000 heat-treated; high ductility; high abrasion resistance. For turbine blading, shafting, valve parts, wire cable, screens, nuts and bolts.

1 - 3 - 5 - - - - -
Type 416, U. S. S.-12 F. M.; carbon .15 max, manganese 1.0 max, phosphorus .04 max, sulphur or selenium .07 or molybdenum .6 max, silicon 1.0 max, chromium 12-14. Similar to Type 410 except addition of sulphur, selenium or molybdenum increases the machinability. Not to be used where welding is required. Used for shafting, nuts, bolts, valve, trim and valve parts.

1 2 - - 5 - - - - -
Type 430, U. S. S.-17; carbon .12 max, manganese 1.0 max, phosphorus .04 max, sulphur .03, silicon .7, chromium 14-18. Resists corrosion caused by nitric acid, atmosphere and industrial corrosives. Resists heat to 1550 deg F; medium abrasion resistance; ts, ult, 70-90,000 psi. Used in nitric acid equipment, as screens, valves, shafting, nuts, bolts, rivets and plate construction.

1 2 - - - - - - - -
Type 446, U. S. S.—27; carbon .35 max, manganese 1 max, phosphorus .04 max, sulphur .04 max, silicon 1.0 max, chromium 23-27. Resists heat to 2100 deg F; medium abrasion resistance; ts, ult, 75-95,000 psi. For high temperature service, where resistance to sulphides and concentrated nitric acid is required.

Type 501, U. S. S.-5; carbon over .1 and chromium 4-6.

Type 502, U. S. S.-5-S; carbon .1 max, chromium 4-6. Molybdenum .5 is added to increase creep strength and avoid temper brittleness. Columbium is added to eliminate air hardening and increase oxidation resistance slightly.

1 2 - - - - - - - -
Shelby 5 per cent chrome-molybdenum tubing; used for furnace tubes in oil-cracking stills, condensers and superheaters where high temperatures and pressures, and corrosive fluids are handled; chromium .15 max, manganese .5 max, silicon .5 max, carbon 4-6, and molybdenum .45-.65.

Shelby tubing may be obtained in many additional grades from the lowest carbon boiler tube steel to the stainless grades of alloy steel which are available in tubing in all sizes up to 10¾ in. OD. A number of steels made to SAE standards are also furnished in Shelby tubing.

1 2 3 - - - - - - -
Castings furnished by Lorain Div.; Type A-1; carbon .3-.4, chromium .75-1, nickel 2.5-3, manganese .6-.8, and molybdenum .3-.4; Type A3; carbon .45-.55, chromium .75-.9, nickel .6-.8, manganese 1.5-2, and molybdenum .3-.4; and Type MS-1; carbon 1.4, manganese 10-14 with or without chromium .75-1.

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Electrical steel sheets for use in transformers, motors and generators; eleven principal grades of electrical sheets furnished—U. S. S., Pole, Field, Armature, Electrical, Motor, Dynamo, Radio Transformer 72, and Transformer 72, 65, 58, and 52.

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Other materials are furnished as follows: Carnegie-Illinois Steel Corp., Columbia Steel Co., Tennessee Coal, Iron & Railroad Co., and United States Steel Supply Co.; stainless steel in sheets, plates, shapes and bars; National Tube Co., and Tubular Alloy Steel Corp.; in pipe and tubular shapes; and American Steel & Wire Co., in strip and wire forms.

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U.S.S. AR STEEL (Abrasion Resisting Steel)—Carnegie-Illinois Steel Corp., Pittsburgh; Columbia Steel Co., San Francisco; and Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. Carbon .85.5, manganese 1.5-2, phosphorus .05 max, sulphur .055 max, silicon .15-.3. Furnished in bars, sheets, strip, plates and shapes; high abrasion resistance; Bhn, approx., 200-275 as rolled, heat-treated, 350-450. Used for wear resisting surfaces.

See advertisement, Page 158

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U.S.S. CARILLOY—Carnegie-Illinois Steel Corp., Pittsburgh. Alloy steels in all standard grades of AISI and SAE steels sold under the above tradename.

See advertisement, Page 158

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U.S.S. COR-TEN—Carnegie-Illinois Steel Corp., Pittsburgh; Columbia Steel Co., San Francisco; and Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. Carbon .12 max, manganese .2-.5 max, phosphorus .07-.15, silicon .75 max, copper .3-.5, chromium .50-1.25, furnished in bars, sheets, strip, plates, structural and bar shapes, for hot and cold forming, welding, riveting, etc. Resists atmospheric corrosion four to six times that of plain carbon steel; abrasion resistance, good; yield point 50,000 min; ts, 70,000 psi min, with high ductility; weldability, good. Used for light-weight construction, where atmospheric corrosion-resistance is a major factor.

See advertisement, Page 158

1 - 3 4 - - - - - -
U.S.S. MANG-NI-CU Steel—Carnegie-Illinois Steel Corp., Pittsburgh 30. Carbon .25 max, manganese 1.50 max, phosphorus .08 max, sulphur .05 max, silicon .25 max, copper .25-.50, nickel .50-1.00. Furnished in rough bars or billets, finished rods or bars, strips (coiled), sheets, plates and structural shapes, for hot and cold forming, riveting, etc. Resistance to corrosion 3 times that of plain carbon steel; abrasion resistance, good; ductility, good; weldability, good; yield point, 50,000 psi min; ts, 70,000 psi min. Used for lightweight construction where atmospheric corrosion and welding are of major importance.

See advertisement, Page 158

- - 3 4 - - - - - -
U.S.S. MAN-TEN—Carnegie-Illinois Steel Corp., Pittsburgh; Columbia Steel Co., San Francisco; and Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. Carbon .25 max, manganese 1.1-1.6, phosphorus .04 max, sulphur .05 max, silicon .3 max, copper .2 min; furnished in bars, sheets, strip, plates, structural and bar shapes, for hot and cold forming, welding and riveting; corrosion-resistant; high abrasion resistance; yield point 50 000 min; ts, 75 000 psi min. Used for lightweight construction where atmospheric corrosion resistance is not a major factor.

See advertisement, Page 158

V

- - 3 4 - - - - - -
VASCO—Anchor Drawn Steel Co., Latrobe, Pa. Nonshrinkable oil-hardening drill rods which retain size and shape after hardening and tempering. For small cams and gears, dowel

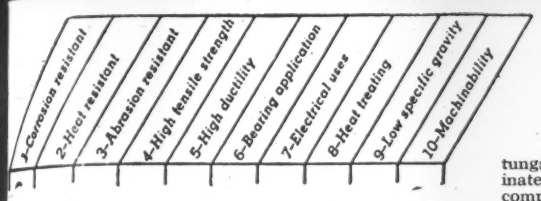
1 - - - - - - - - -
VELVETOUCH—The S. K. Wellman Co., Cleveland, O. Friction materials consisting of a combination of various powdered metals such as copper, tin, lead and other powdered materials, compressed sintered and welded to a solid metal backing for support. Applications include clutch and brake facings, clutch disks, thrust bearings, steam seals, etc.

See advertisement, Page 147

1 - 3 - - - - - - -
VIBRO-ISOLATOR—Korfund Co., Long Island City, N. Y. Coiled steel spring vibration isolator for absorbing shock and preventing vibration transmission. Isolators can be used with or without concrete foundations for stationary and marine installations.

W

1 - - 4 - - - - - 10
WAUKESHA Metal—Waukesha Foundry Co., Waukesha, Wis. Copper-nickel alloy available in twelve different grades. Ult ts, from 40-90.000 psi depending upon alloy; Bhn, 80-150; nonmagnetic; weldability, fair; re-



sists corrosion caused by acids in foods and beverages. For dairy and food, and beverage industries.

. - 3 - - - - - - - -
WEARWELD—Lincoln Electric Co., Cleveland. Bhn, 488-548; suitable for hard-facing wearing surfaces subject to shocks and abrasion.

. - - - 5 - - - - - -
WEIRALEAD—Weirton Steel Co., Weirton, W. Va. Ductile sheets with excellent welding characteristics. Its tight, hot-dipped coating serves as a die lubricant and takes deep drawing successfully. It also provides a satisfactory base for paint, lacquer or varnish.

. - - - 5 - - - - - -
WEIRZIN—Weirton Steel Co., Weirton, W. Va. Electrolytic zinc-coated sheets and strip. Sheets 32½ in. wide (available in coils or cut lengths) down to ⅜-in. strip. Adaptable to a wide variety of uses where the protection of a zinc coated material is required. This material is a high quality ductile steel with bonded coating suitable for deep drawing.

. - - - 4 5 - - - - - 10
WELDRAWN Tubing—Superior Tube Co., Norristown, Pa. Welded tubing, cold-drawn to give properties of seamless. Available in certain grades of stainless and in nickel and monel.

. - - - 4 5 - - - - - -
WELLCAST—The Wellman Bronze & Aluminum Co., Cleveland.

17-S; high-strength, aluminum-silicon-titanium alloy, with high ductility. Used in aircraft castings; ts, 28-30,000 psi.

Magnesium; used for aircraft engine castings; ts, 28,000 psi; 42,000 psi heat treated.

See advertisement, Page 164

1 - 3 4 5 - 7 - - - -
WESTERN SUPER-X—Western Cartridge Co., East Alton, Ill.

1 - - 4 - - 7 - - - -
Grade B 18 per cent nickel-silver; (nominal) copper 55, nickel 18, zinc remainder; in strips (coiled), sheets and plates, for stamping, forming and drawing. Mechanical properties in untreated states: ult ts, 99,500 psi; elongation, 4 per cent; hardness number, 95 Rockwell B; nonmagnetic; weldability, good. For springs, switch blades, contacts, radio parts, etc.

1 - - - 5 - 7 - - - -
Grade A 18 per cent nickel-silver; (nominal), copper 72, nickel 18, zinc remainder; in strips (coiled), sheets and plates, for stamping, forming and drawing. Ult ts, untreated, 78,500 psi; elongation, 5 per cent; hardness, 85 Rockwell B; nonmagnetic; weldability, good. For dairy equipment, musical instruments, deep drawn shells and tubes.

1 - - 4 - - 7 - - - -
Grade E phosphor-bronze; (nominal) copper 96.5, tin 3.5; available in coiled strips and plates, for stamping, forming and drawing. Untreated ult ts, 79,500 psi; elongation, 8 per cent; hardness, 87 Rockwell B; density, .320 lb per cu in.; nonmagnetic. For fuse clips, spring clips, vibrator springs, etc.

Grade C phosphor-bronze; (nominal) copper 92, tin 8; available in coiled strips and plates, for stamping, forming and drawing. For metal rolled 4 B&S numbers hard, mechanical properties in untreated state: ult ts, 93,500 psi; elongation, 13; hardness, 94 Rockwell B; density, .310 lb per cu in.; nonmagnetic. For springs, diaphragms, contacts, etc.

1 - 3 4 - - - - - - -
Grade A phosphor-bronze; (nominal) copper 95, tin 5; furnished in strips and plates for stamping, forming and drawing. For metal rolled 4 B&S numbers hard, mechanical properties in untreated state: ult ts, 79,500 psi; elongation, 8 per cent; hardness number, 87 Rockwell B; density, .320 lb per cu in.; nonmagnetic; abrasion resistance, high. For springs, contacts, diaphragms, fuse clips, bellows, clutch disks, etc.

. - - - - - 7 - - - -
WILCO—H. A. Wilson Co., Newark, N. J.

. - - - - - 7 - - - -
Contact materials; electrical; silver, platinum, tungsten and alloy contacts; silver-steel laminated contacts for projection welding; silver composite contacts; silver and platinum inlay and overlay on base metals. Furnished in sheet and wire.

Thermometal; thermostatic bimetals furnished in strips and formed parts for temperature control and compensation.

Precious metal collector rings for rotating controls.

Silver Clad Steel for aircraft engine bearings and other parts.

Jacketed wire; silver on steel, copper, Invar, or other combinations requested.

See advertisement, Page 167

1 - - - - 5 6 - - - -
WOLVERINE—Wolverine Tube Div., Detroit.

1 - - - - - 6 - - - -
Aluminum brass; copper 76, zinc 22, aluminum 2; furnished in tubing; corrosion-resistant; medium abrasion-resistant; ts, 52-100,000 psi. For bushings, condenser tubing.

Phosphorus-bearing Admiralty brass; copper 70, zinc 29, tin 1, residual phosphorus .001-.1; furnished in tubing; medium abrasion resistance; ts, 48-90,000 psi; for condenser tubing.

1 - - - - - 6 - - - -
Phosphorized arsenical Admiralty brass; copper 70, zinc 29, tin 1, phosphorus .015 max, arsenic .35 max, furnished in tubing; corrosion-resistant; balance same as Admiralty.

1 - - - - - - - - - -
70-30 brass; copper 70, zinc 30; furnished in tubing; corrosion-resistant; medium abrasion-resistant; ts, 48-88,000 psi. Used for condenser tubing.

1 - - - 5 - - - - - -
Red brass; copper 85, zinc 15; furnished in tubing; corrosion-resistant; medium abrasion resistance; ts, 40-69,000 psi; high ductility; for condenser tubing.

1 - - - - - 6 - - - -
Common high-brass; copper 66, lead .65 max, zinc balance; furnished in tubing; corrosion resistance; medium abrasion resistance; ts, 48-85,000 psi. For cupped, formed or drawn parts, etc.

1 - - - - 5 - - - - -
Copper, oxygen-free; copper and silver 99.9 min, phosphorus .015-.035 (optional as deoxidizer); furnished in tubing; corrosion-resistant; ts, 31-60,000 psi; high ductility. For condensers, evaporators, heaters, condenser tubes, etc.

1 - 3 - - - - - - - -
Cupro-Nickel; copper 70, nickel 30; furnished in tubing; corrosion-resistant; medium abrasion resistance; ts, 65-110,000 psi; for condenser tubing.

Copper, arsenical; copper and silver 99.2 min; phosphorus .015-.035, arsenic .15-.50; balance is the same as oxygen-free copper.

Commercial bronze; copper 90, zinc 10; furnished in tubing; corrosion-resistant; available in color; medium abrasive resistance; ts, 36-63,000 psi; high ductility; for ornamental purposes.

Low brass; copper 80, zinc 20; furnished in tubing; resists corrosion; medium abrasive resistance; high ductility; ts, 43-78,000 psi. For bellows, ornamental purposes and fabricated parts.

. - - - - 6 - - - 10
High brass (2 & 1); free turning; copper 66, lead 1.75, zinc balance; furnished in tubing; corrosion-resistant; medium abrasion resistance; ts, 48-85,000 psi; machinability. For screw machine parts and fabricated parts.

1 - - - - - - - - - -
Naval brass; copper 60, tin .75, zinc balance; furnished in tubing; corrosion and abrasion resistance; ts 55-100,000 psi. Used where corrosion resistance with high strength is required.

1 - - - - - - - - - -
Muntz metal; copper 60, zinc 40, furnished in tubing; corrosion and abrasion resistance; ts, 48-85,000 psi; for condenser tubes, etc.

1 - - - - - - - - - -
Aluminum 2S; aluminum 99; furnished in tubing; ductility good; ts, 13-24,000 psi; machinability, poor. Used for airplane parts, oil burners, etc., where light weight is important.

Aluminum 3S; aluminum 97, manganese 1.25; furnished in tubing; ductility, good; ts, 16-29,000 psi; machinability good. Used for airplane parts, oil burners, etc., where light weight is desired.

1 - 3 - - - - - - - -
WORTHITE—Worthington Pump & Machinery Corp., Harrison, N. J. Nickel 24, chromium 20, molybdenum 3, silicon 3.25, carbon .07 max, copper and manganese 2, balance iron; furnished in finished rods or bars and as sand and centrifugal castings for turning, boring, welding, etc.; corrosion-resistant; heat resistance 2000-2200 deg F; high abrasion resistance; ts, 97,000 psi, hot rolled, 72,000 psi sand cast; medium ductility sp gr, 7.85, Bhn, 150-190. Used for pumping equipment, valves, pipe fittings and special apparatus for corrosion resistance.

Y

1 - - - 4 5 - - - - -
YOLOY—The Youngstown Sheet & Tube Co., Youngstown, O. Carbon .05-.35 manganese .3-1.2, nickel 1-2, copper .75-1.25; special service alloy steel furnished in rough bars or billets, finished rods or bars, tubing, wire, sheets, coiled strip, and plates, for hot forging, stamping, extruding and welding. Mechanical properties in untreated state: ult ts, 70,000 psi and up, depending on carbon and manganese content; yield point, 50,000 psi min; impact resistance, high; Bhn, 130 and up, depending on analysis; weldability, excellent; good machinability.

Z

1 - - - 4 5 - - - - -
ZAMAK—New Jersey Zinc Co., New York. Zinc alloys for die cast parts.

No. 2; aluminum 4.1, copper 2.7, magnesium .03, remainder Horse Head Special zinc.

No. 3; aluminum 4.1, magnesium .04, remainder Horse Head Special zinc.

No. 5; aluminum 4.1, copper 1.0, magnesium .04, remainder Horse Head Special zinc.

See advertisement, Page 253

1 - - - 4 5 - - - - -
ZILLOY—The New Jersey Zinc Co., New York. Rolled zinc alloys containing approximately 1 per cent copper. Furnished in sheets and strips for forming and stamping.

See advertisement, Page 253

1 - - - - 5 - - - - -
ZINCGRIP—American Rolling Mill Co., Middletown, O. Galvanized sheet iron or steel, in strips or coils, with unusual forming and drawing qualities; for use wherever severe forming makes ordinary galvanized sheet metal unsatisfactory. Also supplied with a Paintgrip treatment.

. - - - - 5 - - - - -
Hot and cold-rolled steels; obtainable in ARMCO ingot iron and ARMCO high-tensile steel, copper-bearing steel and varying analyses of medium and low carbon steel. Available in sheet form; for severe forming requirements.

1 - - - - 5 - - - - -
Long terne; terne coated sheets with ingot iron, mild steel, or high-tensile steel base metal. For deep drawing requirements and paintability.

Spiral-welded pipe, in wall thicknesses of 7/64 to ½ inch, diameters 6 to 36 inches and lengths up to 50 feet; supplied mill coated, galvanized or bituminous coated and lined. Available standard or custombuilt fittings. Base metal mild or high tensile steel.

. - - 3 - - 6 - - - 10
Z-METAL—Ferrous Metals Corp., New York 22. Carbon 2.00-2.60, combined carbon .30-.80, silicon .90-1.20, manganese .70-1.25. Mechanical properties in heat-treated state: Ult ts, 70-90 000 psi; yield point 48-65,000 psi; elongation, 8-18 in 2 in.; Bhn, 155-225; magnetic; resists corrosion caused by salt water, etc.; heat-resistant to 800 deg F max (not much loss in physicals to 1000 deg F); abrasion resistance, high. For chain links, sprockets, levers, gears, cams, connecting rods, cranks, pump parts, hydraulic jack bodies, elevator buckets, etc.

See advertisement, Page 307

1 2 - - - - - - - - -
ZORITE—Michiana Products Corp., Michigan City, Ind. Nickel 35, chromium 15, sand castings; ult ts, 63,500 psi; yield point, 36,500 psi; elongation, 5 per cent; Bhn, 168; slightly magnetic; weldability, good; heat resistant to 2200 deg F; abrasion resistance, medium. For furnaces, heaters, electrical resistances.

Index of Alloys by Principal Constituents

OFTEN the engineer responsible for design selects the material for a machine part according to the base metal and certain alloying elements which are known to influence the properties in a desired direction. To provide the designer with a key between alloying constituents and tradenames the accompanying cross-reference index has been compiled. Further information on each alloy may be obtained by referring to the alphabetical listing by tradenames under "metals", commencing on Page 174.

Tradenamed alloys are indexed primarily under the base metal or predominating element or, in some cases such as bearing metals, under the primary use. Alloying elements which control the properties of the material are arranged alphabetically as subheads under the main heads. In a few cases additional controlling elements are added in italics.

IRON AND STEEL

C
- Agaloy tubing
- Amercut
- CMP strip
- Globe
- Jalcase
- Page wire
- Summerill
- U. S. S. Carilloy

Cr
- B & W Croloy
- Bethlehem
- Carpenter
- Chromeweld 4-6
- Circle L
- Cooper
- Duraloy
- Duro-Gloss
- Eis 45
- Enduro
- Globe
- Ingersoll
- K-42-B (*Ti*)
- Kleenkut
- LoCro
- Ohmaloy (*Al*)
- Pittsburgh Stainless
- Republic
- Rezistal
- Rustless
- Sealmet
- Sta-Gloss
- Sterling
- Summerill
- Superior
- U. S. S.
- U. S. S. Cor-Ten

Cr-Mo
- Amsco
- Atlas No. 93
- B & W Croloy
- Bethlehem 88-80
- Cecolloy
- Circle L
- Continental
- DM-45
- DM Steel
- Electrunite
- Farrell's 85
- Hardtem (V)
- Heppenstall 5H5O (V)
- Nitralloy (*Al*)
- Pyrasteel (*Si*)

Cr-Mo-Ni
- Continental
- Cuprodie
- Durodi
- Finkl
- Heppenstall 2 C 30
- Hy-Ten
- Sandusky Alloy Iron
- Sicromo (*Si*)
- Summerill
- Superior
- Timken
- Tisco
- U. S. S.
- Worthite

Cr-Ni
- Accoloy
- Allegheny Metals
- Amsco
- Apollo Chromsteel
- Armco
- B & W Croloy
- Carpenter
- Chromax
- Chromel
- Cimet
- Circle L
- Continental
- Cooper
- Duraloy
- Durco
- Durimet
- Electrunite
- Enduro
- Evansteel
- Fahralloy
- Fahrite
- Frankite
- Globe
- Gloweld
- Hi-Gloss
- Ingaclad
- Jessop
- Mayari
- Mumetal (*Cu*)
- NA, NA-1, NA-2
- Ni-Hard
- Par
- Pittsburgh Stainless
- Pyrasteel
- Rezistal
- Rustless
- Sharon
- Silfram (*Si*)
- Sterling
- Sterloy
- Summerill
- Superior
- Timken
- Tisco
- Tophet
- U. S. S.
- Zorite

Cr-Mn
- Adamantine
- Bisco
- Circle L
- Eis 57
- Elastuff Chro-Moly
- Fivepoint Deephard Steel
- Hy-Ten (*Mo*)
- Lukens
- Nurex
- Stoody
- Supertemp
- Timken
- Tisco

Cr-V-W
- Mo-Max (*Mo*)
- Seminole

Cu
- Beth-Cu-Loy
- U-Loy
- Yoloy (*Ni*)

Mn
- Amsco
- Apolloy Metal (*Cu*)
- Circle L
- Naco
- Rol-Man
- Strainfree Elastuf
- Stressproof
- Tisco
- Toledo Alloy (*V*)
- U. S. S. Man-Ten

Mn-Mo
- Amola
- Circle L
- Continental
- Deward
- Jefaloy (*Si*)
- Lukens
- MacHempite
- Max-El
- Mo-Mang

Mn-Ni
- Allegheny Ludlum
- Amsco
- Continental
- Timang
- U. S. S. Mang-Ni-Cu

Mn-Si
- Armasteel
- Bethlehem
- Carpenter
- Cecolloy Iron
- Columbia
- Graph-Sil
- N-A-X High Tensile
- Speed Case
- Speed Treat
- Supermal
- Z-Metal

Mo
- Aldecor
- Circle L
- Economo
- Lukens
- Timken
- U. S. S.

Mo-Ni
- Bethlehem
- Cecolloy
- Circle L
- Continental
- Elastuf (*CrV*)
- Fivepoint Deephard
- Tigeralloy

Ni
- Allegheny Ludlum
- Alnico (*AlCo*)
- Carpenter
- Graph-M.N.S. (*SiMoCrMn*)
- Hytemco
- Invar
- Kovar (*Co*)
- Lukens
- Nilvar
- Ni-Resist (*CuCrSiMn*)
- Ni-Tensyliron
- Republic
- Univan (*V*)
- Yoloy (*Cu*)

S
- Ultra-Cut
- Union

Mo-Si
- Durichlor
- Graph-Mo
- Silmo
- Toledo Alloy

Si
- Allegheny Ludlum
- Armco
- Duriron

V
- Anchor
- Python

Other Alloy Steels
- Amercut
- Dodge
- Duraspun
- Neloy
- Nirex
- Republic
- Smavroc
- Tamco (*Ti*)

Alloy Cast Iron
- Cecolloy
- Cimet
- Crasfloy
- Elverite
- Frankite
- Gunite
- Hitest
- Iralite
- Meehanite
- Ni-Hard
- Ni-Resist
- Ni-Tensyliron
- Sandusky Alloy Iron
- Shenango-Penn
- Tamco
- Tawilco
- Tuftest

Malleable Iron
- Belectric
- Belectromal
- Belmalloy
- Ermal
- Ermalite
- Mallix
- Perduro
- Promal
- Shockproof
- Supermal

Special Steels (not otherwise classified)
- American Quality
- Aristoloy
- AW
- AW Dyn-El
- Binney Metal
- CMP Strip
- Colorstrip
- Cooper Alloys
- Cromonite
- Cuprodie
- Damascite
- Dyn-El
- Elastuf-Penn
- Electromet
- Farrell's Hard Edge
- National Graphitic Steel
- Ostuco
- Pluramelt
- Pompton
- Premier
- Red Anchor
- Republic
- Rex Z Metal
- Standard
- Stoodex
- Stoodite
- Superior
- Superstrip
- Talon
- Thomastrip
- Vasco
- Weldrawn
- Zincgrip

Iron
- Armco
- Byers (wrought)
- Globeiron
- Toncan Iron

ALUMINUM BASE

Al and Al Alloys
- Alcoa
- Apex (*AlMgZn*)
- Bohnalite
- Doler-Alumin
- OH-38

Permite
Precision
Red Aluminum Alloys
Revere
Tenual
Trualoy
Wellcast
Wolverine

BEARING METALS

Babbitt
Acorn
Adamant Super-Genuine
Bearite
Bermax
Defender Metal
Dutch Boy
Genuine Sovereign
Glyco Babbitt
Johnson
Lotus Babbitt
Lumen Alloys
Magnolia
Mogul Babbitt
Pyramid Metal
Stannum Babbitt

Other Bearing Metals
Agricola
Ampco Metal
Anfriloy
Asarcoloy
Bearium Metal
Beckett Metal
Bound Brook
Bunting
Commercial
Compo
Cramp Alloys
Durex
Federal Bronzes
G Alloy
Glacier
Gramix
Graphalloy
Hy-Speed
Idealoy
Indium
JSB
Johnson
Ledaloyl
Lubrico
Lubrik
Lumen Alloys
Machine Bronze
Magnolia
Metaline
Moccasin
Moraine
Mueller 600
National
Oilite
Porex
Powdiron
Promet
Pure Carbon
Randall
Sabeco
Satco
Selflube
Sumet
Trualoy

BIMETALS

Chace Thermostatic
Dole Thermostatic
Truflex
Wilco Thermometal

BONDED OR PLATED

American
Apollo
Brassoid
Bundyflex
Chromaloid
Copperweld
Ingaclad
Jessop
Makepeace
Nickeloid
Paintgrip
Platinum-Clad
Superior
SuVeneer
Thomastrip
Weiralead
Weirzin
Zincgrip

BISMUTH BASE

Bi and Bi Alloys
Cerrobase
Cerrobend
Cerromatrix

CARBON BASE

Morganite
Pure Carbon
Speer

COBALT BASE

Delloy
Kennametal

COPPER BASE

High Copper
Ampco Metal
Anaconda
Bridgeport
Elkaloy
Elkonite
Gempco
Mallory
Phos-Copper
Trualoy
Wolverine

Cu-Ag
Cupaloy
Sil-Fos
Wolverine

Cu-Al
Ampco Metal
Avialite
Frontier
Lumen Alloys
McGill
Tempaloy
Trualoy

Cu-Al-Fe
Alcumite
Ampcoloy
Ampco Metal

Cu-Be
Ampco Metal
Anaconda
Beraloy "A"
Berylco No. 25
Riverside
Summerill

Cu-Ni
Advance
Ajax-Hamilton
Ambrac
Ampco Metal
Anaconda
Bridgeport
Chase
Copel
Cupron
Cupro-Nickel
Dairywhite
Frontier
Lumen Alloys
Nicuite
Telnic Bronze (*PTe*)
Waukesha
Western

Cu-Pb-Zn
Chase
Scovill Free-Cutting Brass
Scovill Hardware Bronze
Wolverine

Cu-Si
Auromet
Bridgeport
Duronze
Everdur (*Mn*)
Herculoy
McGill
Olympic Bronze

Cu-Sn
Ampco Metal
Anaconda
Bearium Metal
Bridgeport
Elephant Brar
Frontier
Lumen Alloys
Moccasin (*Pb*)
National
Sabeco (*Pb*)
Sandusky Bronzes
Shenango-Penn
Western

Cu-Sn-Zn
Antimonial Admiralty (*Sb*)
Bridgeport
Chamet Bronze
Idealoy
Nicuite (*Ni*)
Oreide
Roman Bronze
Scovill
Scovill Naval Brass
Tobin Bronze
Wolverine

Cu-Zn
Aeterna 600
Ampco Metal
Anaconda
Bridgeport
D-H-S Bronze (*AlFeMn*)
Doler-Brass
Lumen Alloys
Mueller 600 Bronze
Revalon (*Al*)
Sandusky Bronzes
Tombasil (*Si*)
Western
Wolverine

Other Cu Alloys
Anfriloy (*CuPbSn*)
Beckett Metal
Bronzochrom
Chase Tellurium Copper
Clevite (*CuPb*)
Cupaloy (*AgCr*)
Doler-Brass
Harris 80-10-10
Hy-Ten-Sl Bronze
LMC
Precision
Resistac
Sil-Fos (*AgP*)
Sumet
Titan
Wolverine

ELECTRODES

Abrasoweld
Aerisweld
Agile
Agile-Actarc
Aluminweld
Ampco-Trode
Castolin
Chromeweld 4-6
Cletaloy
Coldweld
Colmonoy
Durface
Faceweld
Ferroweld
Fleetweld
Hardweld
Hascrome
Lightweld
Manganweld
Murex
Nickelchromeweld
Oxweld
Penn
Planeweld
Shieldarc
Softweld
Stainweld
Surfaceweld (powder)
Toolweld
Trodaloy
Wearweld

LEAD BASE

Pb and Pb Alloys
G Alloy
Satco
Tubeloy

MAGNESIUM BASE

Mg and Mg Alloys
Doler-Mag
Dowmetal
Flylight
Hills-McCanna
M-13
Mazlo
Revere
Superior
Wellcast

MOLYBDENUM BASE

Mo and Mo Alloys
Fansteel Molybdenum
MCA Molybdenum
Mo-Lyb-Den-Um
Tamco

NICKEL BASE

Ni and Ni Alloys
Agaloy tubing
Chromax
Chromel (*Cr*)
Cooper
Driver-Harris
Hastelloy
Hipernik (*FeMn*)
Illium (*Cr*)
Inconel (*Cr*)
International
Kovar
Monel (*Cu*)
Nichrome
Nilvar
Precision
Shenango-Penn (*Cu*)
Summerill
Tamco
Thermalloy
Tophet
Weldrawn

PLATINUM BASE

Pt and Pt Alloys
Baker
Elkonium
Ney-Oro G (*Au*)
Paliney (*Pb*)
Platinum-Clad
Wilco

POWDER METAL

Durex
Fansteel
Hardy Powders
MD Metal Powders
MRCO Metal Powder
National
Plast-Iron
Plast-Manganese
Plast-Silicon
Plast-Sponge
Porex
Stackpole
Stressite

SILVER BASE

Ag and Ag Alloys
Easy-Flo
Elkonium
Gibsiloy
Handy Flux
Wilco Contact Materials

TANTALUM

Fansteel Tantalum

TITANIUM

Tamco

TUNGSTEN BASE

W
Cleve-Tung
Fansteel Tungsten
Mallory

W-Ag
Cletaloy
Wilco (*Pt*)

W-C
Borod
Carboloy
Firthaloy
Firthite (*Co*)
Haystellite
Stellite
Talide

W-Cu
Cletaloy

ZINC BASE

Zn and Zn Alloys
Brassoid
Chromaloid
Doler-Zink
Nickeloid
Precision
Zamak
Zilloy

New Standard Steel Classifications

	SAE No.	AISI or NE No.	C	Mn	P (max.)	S (max.)	Si	Ni	Cr	Mo	Low Alloy Alternatives
Carbon Steels	1008	C 1008	.10 max.	.30- .50	.040	.050					
	1010	C 1010	.08-.13	.30- .50	.040	.050					
	1015	C 1015	.13-.18	.30- .50	.040	.050					
	1016	C 1016	.13-.18	.60- .90	.040	.050					
	1020	C 1020	.18-.23	.30- .50	.040	.050					
	1022	C-1022	.18-.23	.70-1.00	.040	.050					
	1024	C 1024	.20-.26	1.35-1.65	.040	.050					
	1025	C 1025	.22-.28	.30- .50	.040	.050					
	1030	C 1030	.28-.34	.60- .90	.040	.050					
	1035	C 1035	.32-.38	.60- .90	.040	.050					
	1036	C 1036	.32-.39	1.20-1.50	.040	.050					
	1040	C 1040	.37-.44	.60- .90	.040	.050					
	1045	C 1045	.43-.50	.60- .90	.040	.050					
	1050	C 1050	.48-.55	.60- .90	.040	.050					
	1052	C 1052	.47-.55	1.20-1.50	.040	.050					
	1055	C 1055	.50-.60	.60- .90	.040	.050					
	1060	C 1060	.55-.65	.60- .90	.040	.050					
	1066	C 1066	.60-.71	.80-1.10	.040	.050					
	1070	C 1070	.65-.75	.70-1.00	.040	.050					
	1080	C 1080	.75-.88	.60- .90	.040	.050					
	1085	C 1085	.80-.93	.70-1.00	.040	.050					
	1095	C 1095	.90-1.05	.30- .50	.040	.050					
Free Cutting Steels	1111	B 1111	.08-.13	.60- .90	.09-.13	.10-.15					
	1112	B 1112	.08-.13	.60- .90	.09-.13	.16-.23					
	1113	B 1113	.08-.13	.60- .90	.09-.13	.24-.33					
	1115	C 1115	.13-.18	.70-1.00	.045	.10-.15					
	1117	C 1117	.14-.20	1.00-1.30	.045	.08-.13					
	1118	C 1118	.14-.20	1.30-1 60	.045	.08-.13					
	1132	C 1132	.27-.34	1.35-1.65	.045	.08-.13					
	1137	C 1137	.32-.39	1.35-1.65	.045	.08-.13					
	1141	C 1141	.37-.45	1.35-1.65	.045	.08-.13					
	1145	.....	.42-.49	.70-1.00	.045	.04-.07					
Manganese Steels	1320	A 1320	.18-.23	1.60-1.90	.040	.040	.20-.35				
	1330	NE 1330	.28-.33	1.60-1.90	.040	.040	.20-.35				
	1335	NE 1335	.33-.38	1.60-1.90	.040	.040	.20-.35				
	1340	NE 1340	.38-.43	1.60-1.90	.040	.040	.20-.35				
		NE 1345	.43-.48	1.60-1.90	....	....	.20-.35				
		NE 1350	.48-.53	1.60-1.90	....	....	.20-.35				
Nickel Steels	2317	A 2317	.15-.20	.40- .60	.040	.040	.20-.35	3.25-3.75			NE 8620, 9420
	2330	A 2330	.28-.33	.60- .80	.040	.040	.20-.35	3.25-3.75			NE 1330, 8630, 9430
	2340	A 2340	.38-.43	.70- .90	.040	.040	.20-.35	3.25-3.75			NE 1345, 9442
	2345	A 2345	.43-.48	.70- .90	.040	.040	.20-.35	3.25-3.75			NE 1350, 9445
	2515	A 2515	.12-.17	.40- .60	.040	.040	.20-.35	4.75-5.25			.....
Nickel Chromium Steels	3115	A 3115	.13-.18	.40- .60	.040	.040	.20-.35	1.10-1.40	.55- .75		NE 8620, 9420
	3120	A 3120	.17-.22	.60- .80	.040	.040	.20-.35	1.10-1.40	.55- .75		NE 8620, 9420
	3130	A 3130	.28-.33	.60- .80	.040	.040	.20-.35	1.10-1.40	.55- .75		NE 1330, 8630, 9430
	3135	A 3135	.33-.38	.60- .80	.040	.040	.20-.35	1.10-1.40	.55- .75		NE 1335, 9435
	3140	A 3140	.38-.43	.70- .90	.040	.040	.20-.35	1.10-1.40	.55- .75		NE 1345, 9440
	3141	A 3141	.38-.43	.70- .90	.040	.040	.20-.35	1.10-1.40	.70- .90		NE 1345, 9442
	3145	A 3145	.43-.48	.70- .90	.040	.040	.20-.35	1.10-1.40	.70- .90		NE 1350, 9445
	3150	A 3150	.48-.53	.70- .90	.040	.040	.20-.35	1.10-1.40	.70- .90		NE 9450
	3240	A 3240	.38-.43	.40- .60	.040	.040	.20-.35	1.65-2.00	.90-1.20		NE 1345, 9440
	3310	E 3310	.08-.13	.45- .60	.025	.025	.20-.35	3.25-3.75	1.40-1.75		.....
Molybdenum Steels	4023	A 4023	.20-.25	.70- .90	.040	.040	.20-.35	.....	.....	.20-.30	NE 8620, 9420
	4027	A 4027	.25-.30	.70- .90	.040	.040	.20-.35	.....	.....	.20-.30	NE 9422
	4032	A 4032	.30-.35	.70- .90	.040	.040	.20-.35	.....	.....	.20-.30	NE 8620, 9422
	4037	A 4037	.35-.40	.75-1.00	.040	.040	.20-.35	.....	.....	.20-.30	NE 1330, 8630, 9430
	4042	A 4042	.40-.45	.75-1.00	.040	.040	.20-.35	.....	.....	.20-.30	NE 1330, 8630, 9430
	4047	A 4047	.45-.50	.75-1.00	.040	.040	.20-.35	.....	.....	.20-.30	NE 1335, 9435
	4063	A 4063	.60-.67	.75-1.00	.040	.040	.20-.35	.....	.....	.20-.30	NE 9255
	4068	A 4068	.64-.72	.75-1.00	.040	.040	.20-.35	.....	.....	.20-.30	NE 9262
	4119	A 4119	.17-.22	.70- .90	.040	.040	.20-.35	.....	.40- .60	.20- 30	NE 8620, 8720, 9420
	4125	A 4125	.23-.28	.70- .90	.040	.040	.20-.35	.....	.40- .60	.20-.30	.....
	4130	A 4130	.28-.33	.40- .60	.040	.040	.20-.35	.....	.80-1.10	.15-.25	NE 1330, 8630, 9430
	4137	A 4137	.35-.40	.70- .90	.040	.040	.20-.35	.....	.80-1.10	.15-.25	NE 1340, 9437
	4140	A 4140	.38-.43	.75-1.00	.040	.040	.20-.35	.....	.80-1.10	.15-.25	NE 1345, 9440
	4145	A 4145	.43-.48	.75-1.00	.040	.040	.20-.35	.....	.80-1.10	.15-.25	NE 1350, 9445
	4150	A 4150	.46-.53	.75-1.00	.040	.040	.20-.35	.....	.80-1.10	.15-.25	NE 9450
	4320	A 4320	.17-.22	.45- .65	.040	.040	.20-.35	1.65-2.00	.40- .60	.20-.30	NE 8720, 9422
	4340	A 4340	.38-.43	.60- .80	.040	.040	.20-.35	1.65-2.00	.70- .90	.20-.30	.....
	4615	A 4615	.13-.18	.45- .65	.040	.040	.20-.35	1.65-2 00	.....	.20-.30	NE 8615, 9115, 9420
	4620	A 4620	.17-.22	.45- .65	.040	.040	.20-.35	1.65-2.00	.....	.20-.30	NE 8620, 9115, 9420
	4640	A 4640	.38-.43	.60- .80	.040	.040	.20-.35	1.65-2 00	.....	.20-.30	NE 1340, 9137
	4815	A 4815	.13-.18	.40- .60	.040	.040	.20-.35	3.25-3.75	.....	.20-.30	NE 8615, 8720, 9415
	4820	A 4820	.18-.23	.50- .70	.040	.040	.20-.35	3.25-3.75	.....	.20-.30	NE 8720, 8620, 9422
Chromium Steels	5120	A 5120	.17- .22	.70- .90	.040	.040	.20-.35	.....	.70- .90	.....	NE 8620, 8720, 9420
	5140	A 5140	.38- .43	.70- .90	.040	.040	.20-.35	.....	.70- .90	.....	NE 1340, 9435
	5150	A 5150	.48- .55	.70- .90	.040	.040	.20-.35	.....	.70- .90	.....	NE 1350, 9445
	52100	E 52100	.95-1.10	.30- .50	.025	.025	.20-.35	.....	1.20-1.50	.....	NE 52100A
	.....	NE 52100A	.95-1.10	.25- .45	....	....	.20-.35	.35 Max.	1.30-1.60	.08 Max.	.....
	.....	NE 52100B	.95-1.10	.25- .45	....	....	.20-.35	.35 Max.	.90-1.15	.08 Max.	.....
	...	NE 52100C	.95-1.10	.25- .45	. ..	....	.20-.35	.35 Max.	.40- .60	.08 Max.	.....
Chromium Vanadium Steel	6150†	.....	.48-.55	.65- .90	.040	.040	.20-.35	. .....	.80-1.10	.....	NE 1350, 9445

STANDARD steels here listed include all the current SAE steels and NE steels. Because of the necessity of conserving critical alloying materials, the plain carbon and low alloy steels must be used in preference to the higher alloy steels wherever possible. The NE steels listed in the final column as alternatives are representative of those having approximately the same hardenability values and, in many cases, the same general characteristics.

	SAE No.	AISI or NE No.	Chemical Composition Limits, Per Cent C	Mn	P (max.)	S (max.)	Si	Ni	Cr	Mo	Low Alloy Alternatives
Nickel Chromium Molybdenum Steels	....	NE 8612	.10-.15	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.15-.25	NE 9415, 9420
	....	NE 8615	.13-.18	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.15-.25	NE 9415, 9420
	....	NE 8617	.15-.20	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.15-.25	NE 9415, 9420
	....	NE 8620	.18-.23	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.15-.25	NE 9415, 9420
	....	NE 8622	.20-.25	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.15-.25	.....
	....	NE 8625	.23-.28	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.15-.25	.....
	....	NE 8627	.25-.30	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.15-.25	.....
	....	NE 8630	.28-.33	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.15-.25	NE 1330, 9430
	....	NE 8632	.30-.35	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.15-.25	.....
	....	NE 8635	.33-.38	.75-1.00	....	....	.20-.35	.40- .70	.40-.60	.15-.25	.....
	....	NE 8637	.35-.40	.75-1.00	....	....	.20-.35	.40- .70	.40-.60	.15-.25	.....
	....	NE 8640	.38-.43	.75-1.00	....	....	.20-.35	.40- .70	.40-.60	.15-.25	.....
	....	NE 8642	.40-.45	.75-1.00	....	....	.20-.35	.40- .70	.40-.60	.15-.25	.....
	....	NE 8645	.43-.48	.75-1.00	....	....	.20-.35	.40- .70	.40-.60	.15-.25	.....
	....	NE 8647	.45-.50	.75-1.00	....	....	.20-.35	.40- .70	.40-.60	.15-.25	.....
	....	NE 8650	.48-.53	.75-1.00	....	....	.20-.35	.40- .70	.40-.60	.15-.25	.....
	....	NE 8712	.10-.15	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
	....	NE 8715	.13-.18	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
	....	NE 8717	.15-.20	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
	....	NE 8720	.18-.23	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.20-.30	NE 9422
	....	NE 8722	.20-.25	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
	....	NE 8725	.23-.28	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
	....	NE 8727	.25-.30	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
	....	NE 8730	.28-.33	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
	....	NE 8732	.30-.35	.70- .90	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
	....	NE 8735	.33-.38	.75-1.00	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
	....	NE 8737	.35-.40	.75-1.00	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
	....	NE 8740	.38-.43	.75-1.00	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
	....	NE 8742	.40-.45	.75-1.00	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
	....	NE 8745	.43-.48	.75-1.00	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
	....	NE 8747	.45-.50	.75-1.00	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
	....	NE 8750	.48-.53	.75-1.00	....	....	.20-.35	.40- .70	.40-.60	.20-.30	.....
Silicon Manganese Steels	....	NE 9255	.50-.60	.70- .95	....	....	1.80-2.20	.....	.....	.....	.....
	....	NE 9260	.55-.65	.70-1.00	....	....	1.80-2.20	.....	.....	.....	.....
	....	NE 9261	.55-.65	.70-1.00	....	....	1.80-2.20	.....	.10-.25	.....	.....
	....	NE 9262	.55-.65	.70-1.00	....	....	1.80-2.20	.....	.25-.40	.....	.....
Nickel Chromium Molybdenum Steels	....	NE 9415	.13-.18	.80-1.10	....	....	.20-.35	.30- .60	.30-.50	.08-.15	NE 8615, 8620, 8720
	....	NE 9417	.15-.20	.80-1.10	....	....	.20-.35	.30- .60	.30-.50	.08-.15	.....
	....	NE 9420	.18-.23	.80-1.10	....	....	.20-.35	.30- .60	.30-.50	.08-.15	NE 8615, 8620, 8720
	....	NE 9422	.20-.25	.80-1.10	....	....	.20-.35	.30- .60	.30-.50	.08-.15	NE 8620
	....	NE 9425	.23-.28	.90-1.20	....	....	.20-.35	.30- .60	.30-.50	.08-.15	.....
	....	NE 9427	.25-.30	.90-1.20	....	....	.20-.35	.30- .60	.30-.50	.08-.15	.....
	....	NE 9430	.28-.33	.90-1.20	....	....	.20-.35	.30- .60	.30-.50	.08-.15	NE 1330, 8630
	....	NE 9432	.30-.35	.90-1.20	....	....	.20-.35	.30- .60	.30-.50	.08-.15	.....
	....	NE 9435	.33-.38	.90-1.20	....	....	.20-.35	.30- .60	.30-.50	.08-.15	NE 1335
	....	NE 9437	.35-.40	.90-1.20	....	....	.20-.35	.30- .60	.30-.50	.08-.15	NE 1340
	....	NE 9440	.38-.43	.90-1.20	....	....	.20-.35	.30- .60	.30-.50	.08-.15	NE 1345
	....	NE 9442	.40-.45	1.00-1.30	....	....	.20-.35	.30- .60	.30-.50	.08-.15	NE 1345
	....	NE 9445	.43-.48	1.00-1.30	....	....	.20-.35	.30- .60	.30-.50	.08-.15	NE 1350
	....	NE 9447	.45-.50	1.20-1.50	....	....	.20-.35	.30- .60	.30-.50	.08-.15	.....
	....	NE 9450	.48-.53	1.20-1.50	....	....	.20-.35	.30- .60	.30-.50	.08-.15	.....
	....	NE 9722	.20-.25	.50- .80	....	....	.20-.35	.40- .70	.10-.25	.15-.25	.....
	....	NE 9727	.25-.30	.50- .80	....	....	.20-.35	.40- .70	.10-.25	.15-.25	.....
	....	NE 9732	.30-.35	.50- .80	....	....	.20-.35	.40- .70	.10-.25	.15-.25	.....
	....	NE 9737	.35-.40	.50- .80	....	....	.20-.35	.40- .70	.10-.25	.15-.25	.....
	....	NE 9742	.40-.45	.50- .80	....	....	.20-.35	.40- .70	.10-.25	.15-.25	.....
	....	NE 9745	.43-.48	.50- .80	....	....	.20-.35	.40- .70	.10-.25	.15-.25	.....
	....	NE 9747	.45-.50	.50- .80	....	....	.20-.35	.40- .70	.10-.25	.15-.25	.....
	....	NE 9750	.48-.53	.50- .80	....	....	.20-.35	.40- .70	.10-.25	.15-.25	.....
	....	NE 9763	.60-.67	.50- .80	....	....	.20-.35	.40- .70	.10-.25	.15-.25	.....
	....	NE 9768	.64-.72	.50- .80	....	....	.20-.35	.40- .70	.10-.25	.15-.25	.....
	....	NE 9830	.28-.33	.70- .90	....	....	.20-.35	.85-1.15	.70-.90	.20-.30	.....
	....	NE 9832	.30-.35	.70- .90	....	....	.20-.35	.85-1.15	.70-.90	.20-.30	.....
	....	NE 9835	.33-.38	.70- .90	....	....	.20-.35	.85-1.15	.70-.90	.20-.30	.....
	....	NE 9837	.35-.40	.70- .90	....	....	.20-.35	.85-1.15	.70-.90	.20-.30	.....
	....	NE 9840	.38-.43	.70- .90	....	....	.20-.35	.85-1.15	.70-.90	.20-.30	.....
	....	NE 9842	.40-.45	.70- .90	....	....	.20-.35	.85-1.15	.70-.90	.20-.30	.....
	....	NE 9845	.43-.48	.70- .90	....	....	.20-.35	.85-1.15	.70-.90	.20-.30	.....
	....	NE 9847	.45-.50	.70- .90	....	....	.20-.35	.85-1.15	.70-.90	.20-.30	.....
	....	NE 9850	.48-.53	.70- .90	....	....	.20-.35	.85-1.15	.70-.90	.20-.30	.....
	....	NE 9912	.10-.15	.50- .70	....	....	.20-.35	1.00-1.30	.40-.60	.20-.30	.....
	....	NE 9915	.13-.18	.50- .70	....	....	.20-.35	1.00-1.30	.40-.60	.20-.30	.....
	....	NE 9917	.15-.20	.50- .70	....	....	.20-.35	1.00-1.30	.40-.60	.20-.30	.....
	....	NE 9920	.18-.23	.50- .70	....	....	.20-.35	1.00-1.30	.40-.60	.20-.30	.....
	....	NE 9922	.20-.25	.50- .70	....	....	.20-.35	1.00-1.30	.40-.60	.20-.30	.....
	....	NE 9925	.23-.28	.50- .70	....	....	.20-.35	1.00-1.30	.40-.60	.20-.30	.....
Chromium Nickel Austenitic Steels*	30615—1	303	.15 Max.	2.00 Max.	.040	.18-.35	.75 Max.	7.00-10.00	17.00-20.00	.60 Max.	.....
	30615—2†	303	.15 Max.	2.00 Max.	.12-.17	.040	.75 Max.	7.00-10.00	17.00-20.00	.60 Max.	.....
	30705§	321 347	.08 Max.	2.50 Max.	.030	.030	1.50 Max.	8.00 Min.	17.00 Min.	.....	.....
	30805	316	.10 Max.	2.50 Max.	.030	.030	.75 Max.	10.00-14.00	16.00-18.00	2.00-3.00	.....
	30905	304	.08 Max.	2.00 Max.	.030	.030	.75 Max.	8.00-10.00	18.00-20.00	.....	.....
	30915	302	.08-.15	2.00 Max.	.030	.030	.75 Max.	7.00-10.00	17.00-20.00	.....	.....
Stainless Chromium Irons*	51210	410	.08-.15	.60 Max	.030	.030	.50 Max.	.....	11.5-13.0	.....	.....
	51310	414	.08-.15	.60 Max.	.030	.030	.50 Max.	1.25-2.00	11.5-13.5	.....	.....
	51335	420	25-.40	.60 Max.	.030	.030	.50 Max	.....	12.0-14.0	.....	.....
	X51410	416	.13 Max.	1.20 Max.	.040	.18-.35	.75 Max.	.....	12.0-14.0	.60 Max.	.....
	51710	430	.12 Max.	.60 Max.	.030	.030	.50 Max.	.....	16.0-18.0	.....	.....

*Subject to early revision. †Also contains Vanadium .15 per cent min. ‡Also contains Selenium .15-.35 per cent. §Also contains Titanium .40 per cent min. or Columbium .70 per cent min. AISI denotes American Iron and Steel Institute. Prefix A denotes an open-hearth alloy steel. Prefix B denotes an acid bessemer steel. Prefix C denotes an open-hearth carbon steel. Prefix E denotes an electric furnace steel. Prefix NE denotes a national emergency steel.

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Aluminum alloys—ALCOA
See advertisements, Pages 285, 313

Aluminum Industries Inc., 2438 Beekman St., Cincinnati.
Aluminum base alloys—PERMITE

American Agile Corp., 5806 Hough Ave., Cleveland.
Welding electrodes—AGILE-ACTARC and AGILE

American Brass Co., Waterbury, Conn.
Copper-aluminum alloy—AVIALITE
Copper, aluminum and nickel alloy—TEMPALOY
Corrosion resistant alloys—AMBRAC, TOBIN BRONZE, ANACONDA, EVERDUR
See advertisements, Pages 279-282

American Crucible Products Co., 1301 Oberlin Ave., Lorain, O.
Bearing bronze—PROMET

American Magnesium Corp., 2210 Harvard Ave., Cleveland.
Magnesium alloy—MAZLO
See advertisement, Page 159

American Manganese Bronze Co., Holmesburg, Philadelphia 36, Pa.
Aluminum bronzes—RESISTAC and HY-TEN-SL
See advertisement, Page 307

American Manganes Steel Div., The American Brake Shoe Co., Chicago Heights, Ill.
Cast alloy steels and welding rods—AMSCO
Welding rod—MO-MANG

American Nickeloid Co., 23 Second St., Peru, Ill.
Prefinished bonded-sheet and strip—NICKELOID, CHROMALOID, BRASSOID; AMERICAN Bonded Metals, Copper Steel and Zinc-Plated Steel

American Rolling Mill Co., Middletown, O.
Stainless and high strength steels—ARMCO high silicon steel and pure iron and ingot iron
Galvanized sheet iron or steel—ZINCGRIP and PAINTGRIP

American Smelting & Refining Co., Equitable Bldg., New York.
Cadmium-nickel bearing alloy—ASARCOLOY No. 7
Lead-bearing alloy—"G" ALLOY
Tubing—TUBELOY

American Steel & Wire Co., Rockefeller Bldg., Cleveland.
Carbon steels and alloys—AMERICAN QUALITY
Cold-finished steel bars—AMERCUT
Spring steel—PREMIER
See advertisement, Page 169

Ampco Metal Inc., 1745 South 38th St., Milwaukee, 4.
Corrosion, shock and wear-resistant alloys—AMPCO METAL
Coated welding rods—AMPCO-TRODE
Copper-base alloys—AMPCOLOY
See advertisement, Page 303

Amplex Mfg. Co., Div. of Chrysler Corp., P. O. Box 2718 Harper Ave., Detroit 31.
(See Chrysler Corp.)

Anchor Drawn Steel Co., Latrobe, Pa.
High-carbon steel—RED ANCHOR, ANCHOR Carbon-Vanadium, and VASCO

Apex Smelting Co., 2537 W. Taylor St., Chicago 12
Aluminum, zinc and magnesium alloys—APEX

Apollo Metal Works, 6605 South Oak Park Ave., Chicago 38.
Prefinished cold-rolled steel, and zinc-steel—APOLLO

Apollo Steel Co., Apollo, Pa.
Copper-bearing steel—APOLLOY METAL

Aurora Metal Co., 614 West Park Ave., Aurora, Ill.
Aluminum-bronze alloy—AUROMET

B

Babcock & Wilcox Co., 85 Liberty St., New York.
Corrosion, wear and heat-resisting alloys—ADAMANTINE and ELVERITE

Babcock & Wilcox Tube Co., Beaver Falls, Pa.
Corrosion and heat-resisting seamless and welded steel tubes—B & W CROLOY
See advertisements, Pages 289, 299

Baker & Co. Inc., 113 Astor St., Newark 5, N. J.
Platinum, palladium, gold, silver and their alloys—BAKER and PLATINUM-CLAD

Bearium Metals Corp., 268 State St., Rochester, N. Y.
Bearing bronzes—BEARIUM METAL
See advertisement, Page 310

Beckett Bronze Co., Muncie, Ind.
High-lead bronze—BECKETT METAL

Belle City Malleable Iron Co., Racine, Wis.
Pearlitic malleable iron—BELMALLOY
High-strength malleable iron—BELECTROMAL
Electric-furnace-melted cast iron—BELECTRIC

Metal Hose Div., Bendix Aviation Corp., Philadelphia 44.
Seamless flexible metal hose—ECLIPSE and BENDIX

Beryllium Corp. of Penna., Reading, Penna.
Beryllium-copper—BERYLCO No. 25

Bethlehem Steel Co., Bethlehem, Pa.
Copper-bearing steel—BETH-CU-LOY
High-carbon, manganese and nickel steels; and chromium-molybdenum steel castings—BETHLEHEM
High-temperature alloy steel—SUPERTEMP
Nickel-chromium steels—MAYARI

Binney Castings Co., 2555 Dorr St., Toledo 7, O.
Heat-resisting castings—MIN-OX (Binney Metal) and BINNEY No. 71 and No. 73.

Bissett Steel Co., 945 E. 67th St., Cleveland 8.
Steel tubing—BISCO
Ground shafting—BISCO-CUMBERLAND

Bliss & Laughlin Inc., P. O. Box 945, Buffalo, N. Y.
High-sulphur bessemer screw stock—ULTRA-CUT
See advertisement, Page 306

Bohn Aluminum & Brass Corp., Lafayette Bldg., Detroit.
Light-aluminum alloy—BOHNALITE

Bound Brook Oil-Less Bearing Co., Bound Brook, N. J.
Bearing bronzes—BOUND BROOK and COMPO
Porous iron bearing alloys—POWDIRON
See advertisement, Page 302

Bridgeport Brass Co., Bridgeport, Conn.
High-copper silicon bronzes—DURONZE
Copper and zinc alloys—BRIDGEPORT
Tubing—BRIDGEPORT

Buckeye Brass & Mfg. Co., 6410 Hawthorne, Cleveland.
Bearing bronzes—COMMERCIAL, HYSPEED and LUBRICO
See advertisement, Page 153

Buffalo Wire Works Co. Inc., 430 Terrace, Buffalo.
Wire cloth—BUFFALO

Bunting Brass & Bronze Co., Spencer and Carlton Sts., Toledo, O.
Bearing bronzes—BUNTING
See advertisement, Page 301

Burgess-Parr Co., Freeport, Ill.
Acid-resisting alloy—ILLIUM

Byers Co., A. M., Clark Bldg., Pittsburgh 30.
Wrought iron—BYERS

C

Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh.
Nickel-bronze alloy—NICUITE
Babbitt metal—BEARITE and ACORN
Copper alloy—CUPALOY

Carboloy Co. Inc., 11177 East 8-Mile Rd., Detroit.
Cemented carbide—CARBOLOY

Carnegie-Illinois Steel Corp., Carnegie Bldg., Pittsburgh.
Abrasion-resisting steels—U.S.S. AR STEEL
Alloy steels—U.S.S. CARILLOY
High strength steels—U.S.S. CORTEN U.S.S.

MANG-NI-CU steels and U.S.S. MANTEN
See advertisement, Page 158

Carpenter Steel Co., Reading, Pa.
Stainless and specialty alloy steels—CARPENTER
Low expansion alloys—INVAR
See advertisement, Pages 286, 287

Cerro de Pasco Copper Corp., 40 Wall St., New York.
Bismuth-lead-tin-antimony castings—CERROMATRIX, CERROBASE and CERROBEND

Chace Co., W. M., 1614 Beard Ave., Detroit 9.
Thermostatic bimetals, and manganese alloys—CHACE

Chain Belt Co., 1604 W. Bruce St., Milwaukee 4.
High-tensile, corrosion-resistant castings—REX Z METAL

Chambersburg Engineering Co., Chambersburg, Pa.
Nickel-molybdenum-iron alloys—CECOLLOY and CECOLLOY IRON

Chase Brass & Copper Co., Waterbury 91, Conn.
Corrosion-resistant copper alloys—OLYMPIC BRONZE, ANTIMONIAL ADMIRALTY. CHAMET BRONZE, CHASE TELLURIUM COPPER and CHASE
High tensile strength bronze—TELNIC Bronze
Tellurium aluminum bronze—CHASE

Chicago Steel Foundry Co., Kedzie Ave. and 37th St., Chicago.
High tensile strength castings—EVANSTEEL and PYRASTEEL

Chrysler Corp., Amplex Div., P. O. Box 2718, Detroit 31.
Bearing bronze—OILITE
Machinery steel—AMOLA
Nonporous, high-density material—DAMASCITE and STRESSITE

Cleveland Graphite Bronze Co., 16800 St. Clair Ave., Cleveland.
Copper-lead strip—CLEVITE

Cleveland Tungsten Inc., 10200 Meech Ave., Cleveland.
Copper-tungsten electrodes—CLETALOY
Tungsten ground seal rod—CLEVE-TUNG

Cleveland Twist Drill Co., The, 1242 East 49th St., Cleveland 14.
High-speed steel—MO-MAX

Climax Molybdenum Co., 500 Fifth Ave., New York 18.
Molybdenum alloying element—MO-LYB-DEN-UM
See advertisement, Page 170

Cold Metal Products Co., The, Youngstown, O.
Carbon and alloy strip steel—CMP STRIP
See advertisement, Page 144

Columbia Steel & Shafting Co., Woodkrik St., Pittsburgh 30.
High-tensile steel—COLUMBIA

Continental Foundry & Machine Co., East Chicago, Ind.
Iron alloys—CROMONITE and CRASFLOY
Carbon steels and alloy steels for rolls—CONTINENTAL
See advertisement, Page 278

Cooper Alloy Foundry Co., 200 Bloy St., Hillside, N. J.
Alloy castings—COOPER ALLOYS

Copperweld Steel Co., Glassport, Pa.
Alloy steels—ARISTOLOY
Copper-covered steel—COPPERWELD

Cramp Brass & Iron Foundries Div. Baldwin Locomotive Works, Philadelphia.
Copper alloys—CRAMP ALLOYS

Crucible Steel Casting Co., Almira Ave., and W. 84th St., Cleveland.
Sand castings—PAR

Crucible Steel Co. of America, 405 Lexington Ave., New York.
High-strength alloy steels—MAXEL
Corrosion and heat-resistant alloys—LO CRO and REZISTAL

D

Dalloy Metals, 3rd & Huntington Sts., Philadelphia 33.
Chromium-cobalt-tungsten alloys—DELLOY METALS

Dodge Steel Co., Tacony, Philadelphia 35.
Electric steel castings—DODGE

Doehler Die Casting Co., 386 Fourth Ave., New York.
Copper-zinc-silicon alloys—DOLER-BRASS and DOLER-ZINK
Magnesium base alloys—DOLER-MAG
Aluminum base die castings—DOLER-ALUMIN

Dole Valve Co., The, 1901 Carroll Ave., Chicago.
Thermostatic bimetal—DOLE

Dow Chemical Co., Midland, Mich.
Magnesium and magnesium alloys—DOW-METAL
See advertisement, Page 289

Driver Co., Wilbur B., Riverside Ave., Newark, N. J.
Beryllium-copper alloys—BERALOY "A", CUPRON and TOPHET

Driver-Harris Co., Harrison, N. J.
Corrosion, heat and wear resisting alloys—ADVANCE, NIREX, NILVAR, CHROMAX, CIMET, NICHROME, HYTEMCO, DRIVER-HARRIS 42 and 52 ALLOYS

Duraloy Co., Scottdale, Pa.
High-chrome, iron and chrome-nickel alloys—DURALOY and DURASPUN

Duriron Co. Inc., Dayton, O. (and licensees—see Duriron in tradename listing).
Corrosion and heat-resistant alloys—ALCUMITE, DURICHLOR, DURIMET, DURIRON and DURCO

E

Electro-Alloys Co., Elyria, O.
Nickel-chromium—THERMALLOY

Electro Metallurgical Sales Corp., 30 East 42nd St., New York 17.
Ferro-alloy—ELECTROMET
See advertisement, Page 150

Erie Malleable Iron Co., Erie, Pa.
Abrasion and wear-resisting cast products—ERMAL and ERMALITE

Eutectic Welding Alloys Co., 40 Worth St., New York 13.
Welding alloys—CASTOLIN, COLDWELD, BRONZOCHROM and DURFACE.

Everhot Products Co., 2055 W. Carroll Ave., Chicago 12.
Copper-fused steel tubing—BUNDYFLEX Tubing

F

Fahralloy Co., Harvey, Ill.
High nickel-chrome—FAHRALLOY

Fansteel Metallurgical Corp., North Chicago, Ill.
Corrosion-resistant, high-tensile-strength metals—FANSTEEL

Farrell-Cheek Steel Co., Sandusky, O.
Abrasion-resisting cast steel—FARRELL

Federal Mogul Corp., 11031 Shoemaker Ave., Detroit.
Bearing bronzes—FEDERAL BRONZES
Babbitt bearing alloys—MOGUL BABBITT
Lead base babbitt—BERMAX BABBITT

Ferrous Metals Corp., 444 Madison Ave., New York 22.
Abrasion resistant alloy—Z-METAL
See advertisement, Page 307

Finkl & Sons Co., A., 2011 Southport Ave., Chicago.
Heat resistant alloys—DURODI and CUPRODIE
Carbon-chrome-nickel-molybdenum alloys—FINKL

Firth-Sterling Steel Co., McKeesport, Pa.
Sintered carbides—FIRTHITE and FIRTHALOY
Stainless steels, and chrome-nickels—STERLING

Foote Bros. Gear and Machine Corp., 5225 S. Western Blvd., Chicago.
Nickel-molybdenum alloy — FIVEPOINT DEEPHARD STEEL

Frank Foundries Corp., Moline, Ill.
Corrosion and abrasion-resistant alloys — FRANKITE

Frontier Bronze Corp., 818 Elmwood Ave., Niagara Falls, N. Y.
Heat and wear-resistang alloys—FRONTIER

G

General Electric Co., Schenectady, N. Y. (and licensees—see Alnico in tradename listing).
Magnet alloy—ALNICO
Welding electrodes—TRODALOY

General Metals Powder Co., Akron, O.
Metallic friction materials—GEMPCO

General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Thermostat metals—TRUFLEX

Gibson Electric Co., 8350 Frankstown Ave., Pittsburgh 21.
Electrical contact materials—GIBSILOY
See advertisement, Page 314

Glacier Metal Co., Richmond, Va.
Bearing babbitt—GLACIER

Globe Steel Tubes Co., Milwaukee.
Seamless steel tubing—GLOBE
High purity ingot iron—GLOBEIRON
Stainless welded tubing—GLOWELD
See advertisement, Page 294

Graphite Metallizing Corp., 1050 Nepperhan Ave., Yonkers 3, N. Y.
Carbon-graphited metallized material — GRAPHALLOY

Great Lakes Steel Corp., Div. of National Steel Corp., Ecorse, Detroit, Mich.
High-tensile, low alloy steels—N-A-X

Gunite Foundries Corp., Rockford, Ill.
Processed high-test cast iron—GUNITE

H

Handy & Harmon, 82 Fulton St., New York 7.
Brazing alloys—HANDY FLUX, SILFOS, and EASY-FLO

Hardy Inc., Charles, 420 Lexington Ave., New York 17.
Powdered metal—HARDY Metal Powders

Harris & Co., Arthur, 212 N. Aberdeen St., Chicago 7.
Copper-nickel alloy—DAIRYWHITE
Bearing metal—HARRIS 80-10-10

Haynes Stellite Co., Kokomo, Ind.
Heat, corrosion and abrasion-resistant cobalt-chromium-tungsten—HAYNES STELLITE
Abrasion-resistant tungsten-carbide diamond substitute—HAYSTELLITE
Impact-resistant, iron-base, hard-facing rod—HASCROME
Nickel-base alloys—HASTELLOY
See advertisement, Page 297

Hedstrom Corp., Oscar W., 4836 W. Division St., Chicago.
Aluminum alloy—OH-38.
See advertisement, Page 305

Heppenstall Co., Hatfield St., Pittsburgh.
Abrasion-resistant alloy steels — HARDTEM and KLEENKUT
High-strength alloy steel—HEPPENSTALL and EIS-45.
Nickel-chrome-molybdenum steel—EIS-57

Hills-McCanna Co., 2349 Nelson St., Chicago.
Magnesium alloy sand castings—HILLS-MCCANNA
See advertisement, Page 143

Hoskins Mfg. Co., 4445 Lawton Ave., Detroit.
Heating element alloys — CHROMEL and COPEL

Howard Foundry Co., Magnesium Div., Chicago.
High tensile strength alloy—FLYLITE

I

Indium Corp. of America, 1676 Lincoln Ave., Utica, N. Y.
Lead-silver solder—INDIUM
See advertisement, Page 312

Ingersoll Steel & Disc Division, Borg-Warner Corp., 310 S. Michigan Ave., Chicago.
Stainless-clad steel—INGACLAD
Stainless steel—INGERSOLL

International Nickel Co. Inc., 67 Wall St., New York (and licensees).
Corrosion, heat and wear-resisting alloys—NI-TENSYLIRON, NI-HARD, NI-RESIST, INTERNATIONAL, NICKEL, MONEL and INCONEL
See advertisements, Pages 163, 250

Jeffrey Mfg. Co., The, First Ave. and Big Four railroad, Columbus, O.
High-strength malleable irons—PERDURO, SUPERMAL and JEFALOY

Jessop Steel Co., Washington, Pa.
Nonmagnetic and stainless steels—JESSOP
Stainless steels—DURO-GLOSS, HI-GLOSS and STA-GLOSS

Johnson Bronze Co., New Castle, Pa.
Bearing metals — JOHNSON, LEDALOYL and JSB
See advertisement, Page 247

Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh.
Free-machining steel—JALCASE

K

Kennametal Inc., 1 Lloyd Ave., Latrobe, Pa.
Carbide alloys—KENNAMETAL
See advertisement, Page 259

Keystone Carbon Co., Saint Marys, Pa.
Self-lubricating porous bronze—SELFLUBE
See advertisement, Page 295

Koppers Co., Bartlett-Hayward Div., Baltimore.
Bronze alloy—D-H-S BRONZE

Korfund Co., Long Island City, N. Y.
Coiled steel spring vibration isolator—VIBRO ISOLATOR

L

Lake City Malleable Co., 5060 Lakeside Ave., Cleveland.
Malleable iron—SHOCKPROOF
See advertisement, Page 316

La Salle Steel Co., 150th and Magnolia, Hammond, Ind.
High-tensile alloy—STRESSPROOF

Lebanon Steel Foundry, Lebanon, Pa.
Alloy cast steels—CIRCLE L
See advertisement, Page 160

Lehigh Babbitt Co., Box 1004, Allentown, Pa.
Babbitt metal—GRAPHO

Lewin-Mathes Co., 1111 Chouteau Ave., St. Louis 2.
Copper and copper alloys—LMC

Lincoln Electric Co., 12818 Coit Rd., Cleveland.
High tensile welding rods—SHIELDARC, LIGHTWELD, MANGANWELD, WEARWELD, HARDWELD, ABRASOWELD, TOOLWELD, AERISWELD, FLEETWELD, STAINWELD, CHROMEWELD, FERROWELD, SOFTWELD, ALUMINWELD, SURFACEWELD, NICKEL CHROMEWELD, PLANEWELD, and FACEWELD

Linde Air Products Co., The, 30 E. 42nd St., New York.
Welding rods—OXWELD
See advertisement, Pages 248, 249

Link-Belt Co., 220 S. Belmont Ave., Indianapolis 6.
Malleable cast iron—PROMAL

Lukens Steel Co., Coatesville, Pa.
Various types of steels—LUKENS

Lumen Bearing Co., 197 Lathrop Ave., Buffalo.
Wear-resisting—MACHINEBRONZE
High-tin babbitt—STANNUM BABBITT
Lead base bearing babbitt—LOTUS BABBITT
Bearing alloys—LUMEN ALLOYS

M

Mackintosh-Hemphill Co., 901 Bingham St., Pittsburgh.
Cast iron—IRALITE
High tensile strength metal—MacHEMPITE

Magnolia Metal Co., 18 W. Jersey St., Elizabeth 4, N. J.
Babbitt metal—ADAMANT Super-Genuine Babbitt and MAGNOLIA Power Nickel-Genuine Babbitt
Antifriction metal—MAGNOLIA, DEFENDER and PYRAMID

Magnus Metal Corp., 80 Jackson Blvd., Chicago. (also 111 Broadway, New York)
Lead base alloy—SATCO Bearing Metal

Makepeace Co., D. E., Attleboro, Mass.
Laminated precious metals—MAKEPEACE

Mallory, P. R., & Co. Inc., Indianapolis.
Welding electrodes—ELKALOY and ELKONITE
Copper base alloys—MALLORY
Electrical contacts—ELKONIUM and ELKONITE

Manganese Steel Forge Co., Allen St. and Butler Ave., Philadelphia.
Forged alloy steel—ROL-MAN

Massillon Steel Castings Co., Massillon, O.
Alloy cast steel—TIGERLOY
Nitriding steel—NITRALLOY

McGill Mfg. Co., Valparaiso, Ind.
Corrosion-resistant alloys—McGILL

Medart Co., 3500 DeKalb St., St. Louis
High tensile strength cast iron—HITEST
Abrasion-resistant cast iron—TUFTEST
Alloy steel forgings—SMAVROC

Meehanite Metal Corp., Pershing Square Bldg., New Rochelle, N. Y. (and foundries—see Meehanite in tradename listing)
Wear, heat and corrosion-resistant metals—MEEHANITE
See advertisement, Page 315

Metal Carbides Corp., Youngstown, O.
Tungsten-carbide metal—TALIDE

Metal & Thermit Corp., 120 Broadway, New York.
Welding electrodes—MUREX

Metals Disintegrating Co. Inc., Elizabeth, N. J.
Powder metal—MD Metal Powders

Metals Refining Co., Hammond, Ind.
Powder metal—MRCO METAL POWDER

Michiana Products Corp., P. O. Box 302, Michigan City, Ind.
Heat and corrosion resisting castings—ZORITE

Michigan Seamless Tube Co., South Lyon, Mich.
Seamless tubing—MICHIGAN
See advertisement, Page 172

Moccasin Bushing Co., 20th and Chestnut Sts., Chattanooga Tenn.
Bearing material—MOCCASIN

Molybdenum Corp. of America, Grant Bldg., Pittsburgh.
Alloying elements—MCA Molybdenum and MCA Ferro-Boron
See advertisement, Page 154

Monarch Steel Co., Ind'anapolis, (also affiliated company, W. J. Holliday & Co., Hammond, Ind.)
Low-carbon, free-machining open-hearth steel—SPEED CASE
Medium-carbon, free-machining open-hearth steel—SPEED TREAT

Moraine Products Div., General Motors Corp., 1420 Wisconsin Blvd., Dayton, O.
Bearing alloys—DUREX and MORAINE
Powder metal—POREX
See advertisement, Page 162

Morganite Brush Co. Inc., 3302 48th Ave., Long Island City, N. Y.
Carbon-graphite-metal—MORGANITE
See advertisement, Page 275

Mueller Brass Co., Port Huron, Mich.
Bearing alloy—MUELLER 600 Bearing Metal

N

National Alloy Steel Division, Blawnox, Pa.
Corrosion-resisting castings — NA, NA-1, NA-2

National Bronze & Aluminum Foundry Co., E. 93d and Laisy Ave., Cleveland.
Aluminum castings—TENUAL

National Erie Corp., Erie, Pa.
Steel castings—NELOY

National Lead Co., 111 Broadway, New York 6.
Babbitt metal—DUTCH BOY BABBITT and HOYT BABBITT

National Malleable & Steel Castings Co., 10600 Quincy Ave., Cleveland.
Alloy cast steel—NACO
Malleable cast iron—MALLIX
Chromium-manganese-carbon alloy—NUREX
High-strength steel—NATIONAL Graphitic Steel

National Molded Products Inc., 122 Mill St., St. Marys, Pa.
Powder metal—NATIONAL

National Smelting Co., P. O. Box 1791, Cleveland 5.
Aluminum alloys—RED X

New Jersey Zinc Co., 160 Front St., New York,
Zinc alloy—ZAMAK and ZILLOY
See advertisement, Page 253

Ney Co., The J. M., 71 Elm St., Hartford, Conn.
Corrosion-resistant alloys — PALINEY and NEYORO G

Nitralloy Corp., The, 230 Park Ave., New York (licensees—see Nitralloy in tradename listing).
Nitriding steel—NITRALLOY
See advertisement, Page 268

O

Ohio Ferro Alloys Corp., Canton, O.
Ferro alloys—PHILO and RANIER

Ohio Seamless Tube Co., Shelby, O.,
Precision tubing—OSTUCO
See advertisement, Page 277

Ohio Steel Foundry Co., The, Lima, O.
Corrosion-heat-resistant materials—FAHRITE

Page Steel & Wire Div., American Chain & Cable Co. Inc., Monessen, Pa.
Low and high-carbon wire—PAGE

Penn Brass & Copper Co., Erie, Pa.
Seamless brass and copper tubing — SUPERIOR

Phosphor Bronze Smelting Co., 2216 Washington Ave., Philadelphia 6.
Phosphor bronze—ELEPHANT BRAND

Pittsburgh Brass Mfg. Co., 3155 Penn Ave., Pittsburgh 1.
Bearing bronze—LUBRIK

Stainless steels—PITTSBURGH Alloy and Stainless Steels

Pittsburgh Steel Foundry Corp., Glassport, Pa.
Manganese-molybdenum alloy — PITALOY and PST
See advertisement, Page 257

Plastic Metals Inc., 143 Bridge St., Johnstown, Pa.
Powder metals — PLAST-IRON, PLAST-MANGANESE, PLAST-SILICON and PLAST-SPONGE

Potts Co., Horace T., E. Erie Ave. and D St., Philadelphia.
Chrome-nickel-molybdenum alloy — ELASTUF, CHRO MOLY and ELASTUF Type A-2.
Manganese type steel—ELASTUF PENN and STRAINFREE ELASTUF PENN

Precision Castings Co., Inc., Syracuse, New York.
Aluminum and zinc base alloys—PRECISION
Magnesium die castings—M-13

Precision Tube Co., 3824 Terrace St., Philadelphia.
Seamless tubing, and metal-shielded wire—PRECISION

Pure Carbon Co. Inc., 441 Hall Ave., St. Marys, Pa.
Pure carbon—PURE CARBON

R

Randall Graphite Products Corp., 609 W. Lake St., Chicago.
Graphite bronze bearings and bushings — RANDALL

Republic Steel Corp., Republic Bldg., Cleveland.
Open-hearth iron alloy—TONCAN IRON
Enameling stock—TONCAN IRON
Copper-bearing steel—U-LOY

Republic Steel Co., Alloy Steel Div., Massillon, O.
High strength alloys—REPUBLIC
Stainless and heat-resisting alloys—ENDURO

Revere Copper & Brass Inc., 230 Park Ave., New York 17.
Nonmagnetic corrosion-resistant, silicon bronze—HERCULOY
Bearing bronze—ROMAN BRONZE
Condenser tubes and plates, REVALON and CUPRO-NICKEL, 30 per cent
Magnesium and aluminum alloys—REVERE

Rhoades, R. W., Metaline Co. Inc., P. O. Box No. 1, Long Island City, N. Y.
Heat-resisting bearing bronze—METALINE

Riverside Metal Co., Riverside, N. J.
Phosphor bronze, nickel silver and beryllium copper—RIVERSIDE

Rustless Iron & Steel Corp., 3400 E. Chase St., Baltimore 13.
Stainless steels—RUSTLESS
See advertisement, Page 271

Ryerson, Jos. T., & Son Inc., 16th and Rockwell St., Chicago.
Specially processed lead base alloys—GLYCO BABBITT
See advertisement, Page 308

S

Saginaw Bearing Co., Saginaw, Mich.
Bearing bronzes—SABECO and AGRICOLA
See advertisement, Page 142

Saginaw Malleable Iron Div., Saginaw, Mich.
Castings—ARMASTEEL

Sandusky Foundry & Machine Co., Sandusky, O.
Nickel-chromium and molybdenum cast iron alloys—SANDUSKY ALLOY IRON
Bronze, brass and manganese bronze alloys—SANDUSKY BRONZES

Scovill Mfg. Co., Waterbury, Conn.
High and low brasses, phosphor-bronzes, nickel-silvers, cupro-nickels, etc. — SCOVILL
Spring material—OREIDE

Sharon Steel Co., Sharon, Penna.
Stainless and heat-resisting alloy—SHARON

Shenango-Penn Mold Co., Dover, O.
High-strength alloys—SHENANGO-PENN
See advertisement, Page 291

Speer Carbon Co., St. Marys, Pa.
Graphitic carbon—SPEER
Carbon welding rod—HOLD-ARK

Stackpole Carbon Co., St. Marys, Pa.
Powder metals—STACKPOLE

Standard Tube Co., 14600 Woodward Ave., Detroit 3.
Electric welded steel tubing—STANDARD
See advertisement, Page 269

Steel & Tubes Division, Republic Steel Corp., Cleveland.
Steel and ferrous alloy tubing—ELECTRUNITE

Sterling Alloys Inc., Woburn, Boston, Mass.
Alloy castings—STERLOY

Stoody Co., Whittier, Calif.
Hard-facing welding rods — SILGRAM, STOODEX, STOODY, STOODITE, BOROD and STOODY TUBE BORIUM

Sumet Corp., 1543 Filmore Ave., Buffalo.
Bronze bearings—SUMET

Summerill Tubing Co., Bridgeport, Montgomery Co., Pa.
Seamless tubing—SUMMERILL

Superior Bearing Bronze Co., 139 Banker St., Brooklyn.
Magnesium castings—SUPERIOR
See advertisement, Page 260

Superior Metal Co., 6651 S. Oak Park Ave., Chicago 38.
Cold-rolled strip steel—SUPERIOR

Superior Metal Works, 66th Place at South Oak Park, Chicago 38.
Prefinished strip steel—SUPERIOR

Superior Steel Corp., Carnegie, Pa.
Stainless strip steel — SUPERIOR STAINLESS
Steel clad metal—SUVENEER
See advertisement, Page 309

Superior Tube Co., Norristown, Pa.
Welded tubing—WELDRAWN

T

Talon Inc., Steel Tube Div., Oil City, Pa.
Welded carbon steel—TALON

Taylor-Wharton Iron & Steel Co., High Bridge, N. J.
Manganese, carbon and alloy steel castings—TISCO
Wear-resisting manganese nickel steel — TIMANG

Taylor-Wilson Mfg. Co., Thompson Ave., McKees Rocks, Pa.
Iron base casting—TAWILCO

Thomas Steel Co., Warren, O.
Cold-rolled strip steel—THOMASTRIP

Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
Abrasion-resistant bearing alloys—GRAPH-SIL, GRAPH-MO and GRAPH-M.N.S.
Creep-resisting alloy steels — DM STEEL, DM-45, SICROMO STEEL
Corrosion and heat-resistant alloys—SILMO, TIMKEN

Titan Metal Mfg. Co., Bellefonte, Pa.
Welding rods—TITAN and PENN

Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
Extra low carbon trimming steel—TAMCO

True Alloys Inc., 284 S. Summit, Detroit.
Aluminum-bronze alloys—TRUALOY

Tyler, W. S., Co., 3615 Superior Ave., Cleveland.
Abrasion-resisting material—TY-LOY

U

Union Drawn Steel Div., Republic Steel Corp., Massillon, O.
Cold-drawn steels—UNION

Union Steel Casting Division, Blaw Knox Co., 62nd and Butler Sts., Pittsburgh.
Nickel-vanadium steel—UNIVAN

Unitcast Corp., Steel Casting Div., Toledo, O.
Alloy and carbon electric steel castings—TOLEDO ALLOY
See advertisement, Page 267

United States Graphite Co., Saginaw, Mich.
Porous Metal—GRAMIX
See advertisement, Page 251

United States Steel Corp., 436 Seventh Ave., Pittsburgh.
(See also American Steel & Wire Co., and Carnegie-Illinois Steel Corp.)
Stainless steels, Shelby and National tubing, castings, electrical steel sheets, copper steel sheets—USS
High strength steels—USS CORTEN, USS MANG-NI-CU Steel and USS MAN-TEN
Alloy steels—USS CARILLOY
Abrasion-resistant steels—USS AR STEEL

W

Wall-Colmonoy Corp., 720 Fisher Bldg., Detroit.
Hard-facing welding rods—COLMONOY

Waukesha Foundry Co., Waukesha, Wis.
Copper-nickel alloy—WAUKESHA Metal

Weirton Steel Co., Weirton, W. Va.
Zinc-coated sheets—WEIRZIN
Ductile sheets—WEIRALEAD

Wellman Bronze & Aluminum Co., 6017 Superior Ave., Cleveland.
Copper-tin-zinc-lead alloys — IDEALOY and ANFRILOY
Aluminum-silicon-titanium alloy — WELLCAST
See advertisement, Page 164

Wellman, S. K., Co., The, 1374 E. 51st St., Cleveland.
Friction material—VELVETOUCH
See advertisement, Page 147

Western Cartridge Co., East Alton, Ill.
Phosphor bronzes and nickel silvers—WESTERN

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Corrosion and heat-resisting alloy—K-42-B
Magnetic alloy—HIPERNIK
Glass seal metal—KOVAR
Copper base alloy—CUPALOY
Brazing alloy—PHOS-COPPER

Wheelock, Lovejoy & Co. Inc., 128 Sidney St., Cambridge, Mass.
Machinery steels—ECONOMO, HYTEN

Wilson Co., H. A., 105 Chestnut St., Newark, N. J.
Contact and thermostatic metals—WILCO
See advertisement, Page 167

Wolverine Tube Div., 1411 Central Ave., Detroit.
Tubing—WOLVERINE

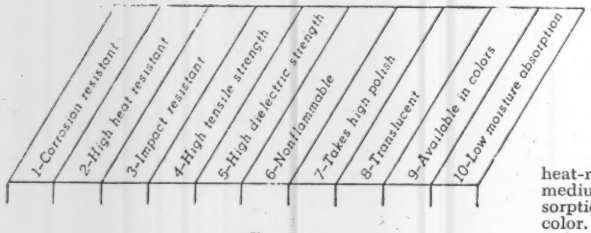
Worthington Pump & Machinery Corp., Harrison, N. J.
Corrosion and abrasion-resistant alloy — WORTHITE

Youngstown Alloy Castings Corp., Youngstown, O.
High tensile strength alloy—TRANTINYL

Youngstown Sheet & Tube Co., Youngstown, O.
High strength alloy steel—YOLOY

Plastics and Other Nonmetallics Listed by Tradenames

(For listing by producing companies, and complete street addresses, see Page 222. For index of plastics by type, see Page 221)



A

1 - 3 - - - - - - - -
ACADIA—Acadia Synthetic Products, Division of Western Felt Works, Chicago. Synthetic rubber compounds to meet Army, Navy and AMS specifications in sheets, extrusions and molded parts.

See advertisement, Page 304

1 - - - - - - 7 - - 10
ACE—American Hard Rubber Co., New York. Hard rubber; thermosetting; furnished in sheets, rods or tubes; may be machined, molded or stamped into part; corrosion-resistant; low moisture absorption; high polish; ts, 4000-10,000 psi; heat resistance, 140-240 deg F; dielectric strength, 450-550 volts per mil.; nonflammable. Uses include handles, caster wheels and special molded parts.

1 - 3 - - - - - - - -
AEROLITE—Pittsburgh Plate Glass Co., Pittsburgh. Laminated thin, window glass with Vinal plastic binder, furnished in flat and bent sheets; corrosion and abrasion resistance, high; heat-resistant up to 160 deg F; flexibility, low; moisture absorption, low; nonflammable; shatterproof; transparent; highly polished. For windows where low weight is important.

1 - - - - - 6 - - - -
AERTITE—Johns-Manville, New York 16. Rubbery, asphaltic-asbestos base; furnished in soft plastic form; corrosion-resistant. Used on mechanical equipment to prevent air infiltration.

1 - - - 5 - - - - 10
ALLYMER—Pittsburgh Plate Glass Co., Columbia Chemical Div., Barberton, O. A complete line of allyl resin monomers formerly known as Columbia resins and designated as C. R. 39 etc. The numbers such as 39 and 149 continue to designate types. Various compounds such as Fiberglas base and allyl resin, allyl alcohol base resin, paper-base and allyl resin, cotton-cloth and allyl resin, for both C. R. 39 and C. R 149 types are available. Thermosetting; furnished in sheets, rods or tubes and laminated form. Properties for these materials include corrosion, heat and impact resistance, high tensile strength and low moisture absorption.

1 - - - - - - - - - 10
AMBERLITE—Resinous Products & Chemical Co., Philadelphia 5. A synthetic resin (adhesive) phenolic resin; furnished in powder form; has low moisture absorption, high density. Used in manufacture of waterproof plywood for aircraft and marine use.

- - 3 - - 6 - - 9 -
AMERICAN FELT—American Felt Co., Glenville, Conn. Felt material furnished in sheet, rods or tubes; for machining, stamping and extruding into parts. Abrasion resistance for certain felts is low, while for others high; resists corrosion caused by neutral conditions; heat-resistant to 250 deg F; flexibility, low, medium or high (as specified); moisture absorption, also as specified; produced in any color. For oil retaining, dust excluding, filtering and vibration dampening.

See advertisement, Page 302

1 2 - 4 - - - - - -
AMERICAN PLYWOOD — American Plywood Corp., New London, Wis. Phenolic urea plywood, furnished in sheet and laminated form; for machining into parts. Abrasion resistance, medium; heat-resistant to 300 deg F; flexibility, high; ts, ult, 12,000 psi; moisture absorption, medium; inflammable; shatterproof; opaque; can be highly polished.

1 2 - - - - - - - - -
AMERIPOL—The B. F. Goodrich Co., Akron, O. Oil-resisting and heat-resisting synthetic rubber; compounded and vulcanized to give wide range of properties. Ts, approximately 4000 psi. In uncompounded form, has specific gravity of 1. Used for grease seals, packing rings, grommets and washers.

- - - - - 6 7 - 9 -
AMEROID—American Plastics Corp., New York. Casein thermoplastic available in sheet, rods or tubes, for machining. Abrasion resistance, medium; heat-resistant to 300-325 deg F; flexibility, low; dielectric strength, 400-700 volts per mil; ts, 10,000 psi; compressive, 27-53,000 psi; moisture absorption, high; produced in color and takes color; sp gr, 1.34; transparent, translucent and opaque; machinability, good; Bhn, 23; soluble in strong acids or alkalies. For handles, bushings, etc., and for small parts where color is desired.

- - 3 4 - - - - - -
ARMORPLY—United States Plywood Corp., 616 West 46th St., New York 19. Plywood, metal-covered; furnished in sheet form: has high strength and low weight; for use in food machinery, laboratories, etc.

1 - - - - - - - - - -
ARMSTRONG'S—Armstrong Cork Co., Lancaster, Pa. Compositions of cork and Neoprene, Buna N, Buna S, Thiokol, and butyl rubber. More than two dozen materials having a wide range of physical properties; furnished in roll, sheet, cut gasket, molded, and extruded forms. Impervious to liquids and gases; highly resistant to deterioration by oils, solvents and most other liquids, gases, corona and weather; high and low coefficients of friction, high and low degrees of compressibility, lateral flow, etc.; available with or without fabric backing, with or without adhesive coating. Furnished to meet specific requirements. Used as gaskets, packings, washers, valve disks, feed rolls, polishing wheels, diaphragms, friction and vibration pads, etc.

Compositions of cork and natural rubber, for specific applications not requiring the special characteristics of synthetic rubber.

Synthetic rubber compounds for applications where requirements include properties such as resistance to oil, aromatic fuel, solvents, sunlight or electrical corona—and where lateral flow is necessary or not objectionable.

Straight cork compositions, ranging in density from 8 lb to 36 lb per cu ft, in compressibility from 5 to 60 per cent, in tensile strength from 60 to 450 psi.

Fibrated leather and other fiber sheet packings including noncorrosive materials, for general gasketing.

Rag felt papers for vibration damping, space packing, anti-squeak lining and use as gaskets, dust seals, etc.

See advertisement, Page 258

B

1 2 3 4 5 6 - 8 9 10
BAKELITE—Bakelite Corp., New York.

1 - - - - - 6 - - - 10
Phenolic plastics, general purpose; thermosetting; furnished in granular form for plastic molding; corrosion-resistant, dielectric strength at 60 cycles, 270-350 volts per mil.; non-flammable; ts, 6000-11,000 psi; low thermal conductivity; available in dark colors; takes high polish; low moisture absorption.

1 2 - - - - - - - - 10
Phenolic plastics, mineral filled. Similar to above. Has high heat resistance, low moisture absorption; and is nonflammable.

1 - 3 - 5 - - - - -
Phenolic plastics, fabric-filled. Similar to general purpose phenolic plastics but are much higher in impact resistance; abrasion-resistant; impact strength (Izod) .23-2.7 ft-lb energy to break. Used for gears, bushings, bearings and heavy-duty parts.

1 - - - 5 - - 8 - -
Urea plastics. Thermosetting; furnished in powder form for plastic molding; sp gr, 1.47-1.52; ts, 9500-12,000 psi; dielectric strength 330-375 volts per mil.; nonflammable; takes high polish; available in colors and translucent pastel shades. Used for housings and other parts requiring translucent or opaque colors resistant to fading.

1 - - - 5 6 - - - -
Polystyrene plastics. Thermoplastic; furnished in powder form for molding; transparent, translucent and opaque effects, in all colors; takes high polish; nonflammable; low moisture absorption; sp gr, 1.05-1.07; dielectric strength at 60 cycles 500-525 volts per mil.; volume resistivity 10 deg megohm centimeters; power factor .0002-.0003 from 60 cycles to 50,000,000 cycles; offers exceptional resistance to acids and alkalis.

1 - - - 5 6 - - - -
Cast resins; produced as BT 44, 45, 48, 55 and 58 types; in rods, sheets, tubes and many special types of castings. BT 44. 45 and 55 are opaque, translucent and mottled; corrosion resistant; of high dielectric strength; low moisture absorption; available in colors. Used for radio cabinets, etc. BT 48 and 58 are crystal clear, transparent colors of any hue; and mottled transparents. Available as castings including rods, sheets and tubes; highly resistant to acids. Used in place of glass and can be readily machined and used for gages, peep holes, etc.

1 2 3 - - - - - - -
BT 63,000 resin is available in ivory, in rods and many other shapes. Used for applications where dimensional stability is required; impact and heat resistant.

1 - 3 4 - - - - - -
BT 61-893; available in plates only; transparent water white; very stable; color-fast;

1-Corrosion resistant
2-High heat resistant
3-Impact resistant
4-High tensile strength
5-High dielectric strength
6-Nonflammable
7-Takes high polish
8-Translucent
9-Available in colors
10-Low moisture absorption

excellent on dimensional stability. Used for photoelastic stress study work.

1 - - 4 - - - - - 10
BT 41-001; available in transparent amber castings and sheets made to order; resistant to hydrofluoric acid. Used where very high dielectric strength and low moisture absorption properties are required.

BT-48-306; nonstatic, used for instrument windows and comes within Navy Specifications.

1 - - - 5 - - 8 - -
BEETLE—Plastics Division, American Cyanamid Co., New York. Urea-formaldehyde base, thermosetting; furnished in powder or granules for molding purposes; available in colors; translucent; high polish; dielectric strength 385 volts per mil.; ts, 5500-7000 psi. Used for housings, cabinets, knobs, dials and insulators.

1 - - - - - 6 - 8 - -
BLUE RIDGE Rolled Figured and Wire Glass—Blue Ridge Div., Libbey-Owens-Ford Glass Co., Toledo, O. Glass furnished in sheet form for cutting and bending into parts; abrasion resistance, high; resists corrosion caused by everything except hydrofluoric acid; heat-resistant to 130-154 deg F; flexibility, low; dielectric strength, 10 kilovolts per mil; ts, 6500 psi; compressive, 36,000 lb per one-in. cube; moisture absorption, low; nonflammable; available in color; sp gr, 2.5; in transparent and translucent types. Used for covers and safety guards, utilizing polished wire glass, or tempered glass.

See advertisement, Page 272

- 2 - 4 - - - - - 9 -
BOOTH FELT—Booth Felt Co. Inc., Brooklyn, N. Y. Wool-base felt; furnished in sheets or strips for machining or stamping into parts; heat resistance 400 deg F; ts 5-100 psi; available in colors and in a variety of types and grades. Used for washers, gaskets, grease seals, and pads for insulating machinery or reducing vibration.

1 - - 4 5 - - - - - -
BRANDYWINE FIBRE—Brandywine Fibre Products Co., Wilmington, Del. Paper-base; furnished in sheets, tubes and rods; for machining and forming into parts. Abrasion resistance, medium; resists corrosion caused by weak acids; heat-resistant to 300 deg F; flexibility, medium; dielectric strength, 300 volts per mil; moisture absorption, medium; available in red, gray and black; shatterproof; sp gr, 1.35; translucent and opaque; machinability, good; takes high polish. For small mechanical and electrical parts.

1 - 3 - - - - - - - -
BUTAPRENE—Firestone Tire & Rubber Co., Akron, O. Synthetic rubber for molding, extruding, calendering and spreading. Has high abrasion resistance when properly compounded; resists corrosion caused by most acids, alkalis and salts; heat-resistant to 275 deg F; flexibility, high; ts, up to 3500 psi; moisture absorption, low; takes color; shatterproof at temperatures above —40 deg F; sp gr, .96-1.0; translucent. For all automotive and aeronautical rubber parts requiring resistance to oils and fuels.

C

1 2 - - - - - - - - -
CARBOCELL—National Carbon Co. Inc., New York 17. Porous carbon available in a variety of standard and special elements, in open and blind end tubes, rods up to 36 inches in length and 6⅝ in. in diam, and plates with maximum dimensions of 12 x 12 x 1½ in. and disks up to 12 in. in diam. Easily machined and fabricated into shapes; resistant to acids and alkalies; not subject to fracture and spalling from thermal shock. For use in filtration of corrosive liquids and gases and in conditions where thermal shock may be expected in chemical and process industries.

- 2 - - - - - - - - -
CARDOLITE Resins—Irvington Varnish & Insulator Co., Irvington, N. J. Derived from cashew nut shell liquid, a high molecular weight unsaturated material with phenolic characteristics. Include brake-lining binders, friction fortifiers and types used in manufacture of electrical insulation; laminating, impregnating and sealing resins.

- - - 4 - 6 - - - 10
CATABOND—Catalin Corp., New York. Phenolic base. Liquid phenolic, thermosetting, laminating and bonding resin; nonflammable; low moisture absorption; fungi-resistant. Used for abrasive wheels, laminated products, surface coating, impregnating and bonding.

1 - - - - 5 6 - - - -
CATALIN—Catalin Corp., New York. Phenolic base, thermosetting; furnished in sheets, rods or tubes, or special castings; high dielectric strength; nonflammable; low moisture absorption; high tensile and compressive strengths; high abrasion resistance; available in colors; insoluble in ordinary solvents. Used for clock and instrument cases, radio housings, etc.

1 2 - - - - 6 - - - -
CELITE—Johns-Manville, New York 16. Diatomaceous silica material; furnished in powdered, granular and brick forms; resistant to chemical corrosion; heat-resistant; nonflammable. Used for insulation of equipment operating at high temperatures.

1 - - - - - - - - 10
CELL-TITE—Sponge Rubber Products Co., Derby, Conn.

Soft; rubber, thermosetting; furnished in sheets, rods or tubes for molding and stamping into parts. Abrasion resistance, low; resists corrosion caused by acids and alkalies; flexibility, high; ts, to 150 psi; moisture absorption, very low; available in color; shatterproof; sp gr, .160-.5; opaque; machinability, fair.

Hard; thermosetting and thermoplastic; in sheets, rods or tubes and in laminated and molded (boards) form; for molding, and machining. Abrasion resistance, low; resists corrosion caused by acids, alkalies; heat resistant to 285 deg F; flexibility, medium; ts, 100-700 psi; compressive, 150-750; moisture absorption, low; shatterproof; sp gr, .08-.50; opaque.

See advertisement, Page 274

- - 3 - - - 7 - 9 -
CELLULOID—Celanese Celluloid Corp., Plastics Div., Celanese Corp. of America, New York. Cellulose-nitrate base, thermoplastic; furnished in sheets, rods and tubes; used for molding, swedging, veneering, machining or stamping into parts; available in colors; high polish ts, 5000-10,000 psi; flexible; resistant to corrosion; dielectric strength 600-1200 volts per mil; transparent. Used for instrument dials, tool handles, key buttons, register wheels, ammunition components, etc.

See advertisement, Page 152

1 - 3 - - - - - 8 -
CEL-O-GLASS—E. I. du Pont de Nemours & Co., Wilmington, 98, Del. Plastic-coated wire mesh which transmits ultra-violet rays; corrosion-resistant; resistant to shock; translucent; flexible; light in weight. Used where an opalescent or translucent, flexible material is required.

1 - 3 4 - - - - - -
CELORON—Continental-Diamond Fibre Co., Newark, Del. Resinous base, thermosetting; furnished in molded parts and laminated forms, for machining into parts; corrosion-resistant; resistant to shock; high tensile and dielectric strength; low moisture absorption; high heat resistance and abrasion resistance; takes high polish. Grade C (canvas base) used for heavy-duty gears. Type L (linen base) used for small gears of fine pitch and narrow face, and intricate punchings.

1 - - - 5 - - 8 - -
CENTRALINE—Central Paper Co. Inc., Muskegon 28, Mich. Wood-cellulose fiber, bleached or unbleached, or of specialty fiber; furnished either coated or saturated with plastic materials; in rolls or sheets, both plain and laminated of two or more thicknesses; abrasion-resistant; resists corrosion caused by atmospheric conditions; heat-resistant; flexible or stiff; low dielectric strength or as high as 325 volts per mil depending on final thickness of paper; tensile strength can be varied as can moisture absorption; available in color; translucent or opaque. Used for coils, motors, gaskets, shims, noncorrosive separations, insulating, filtering, etc.

1 - - - - 6 - - - 10
CERAWARE—General Ceramics Co., New York. Ceramic material for molding, casting, machining and extruding; abrasion resistance, high; resists corrosion except by hydrofluoric acid and caustic alkalies; flexibility, low; heat-resistant to 250 deg F; ts, 2000 psi; compressive, 80,000; moisture absorption, low; sp gr 2.2; opaque; machinability, fair. Used for chemical equipment generally.

1 2 3 - - - - - - - -
CEREX—Monsanto Chemical Co., Plastics Div., Springfield, Mass. A series of new thermoplastic compounds with ASTM heat distortion points of 212-256 deg F. Cerex X214 has ASTM heat distortion point of 220-230 deg F. Parts molded to close dimensional tolerances maintain dimension and mechanical strength during exposure at temperatures over the boiling point of water. Material may be injection molded in standard machines. Excellent acid and alkali resistance, as well as carbon tetrachloride and aliphatic hydrocarbons. Electrical loss properties, good; available in light amber, also a wide range of transparent, translucent and opaque colors. For electronic instrument parts, and any applications where high heat resistance is required.

1 - 3 - 5 - - - 9 10
CHEMACO—Chemaco Corp., Berkeley Heights, N. J.

- - 3 - 5 - - - 9 -
Cellulose acetate; thermoplastic; in powder for molding and extruding. Abrasion resistance, medium; resists corrosion caused by weak acids, weak alkalies and hydrocarbons; heat resistant to 140-220 deg F; dielectric strength, 290-325 (for ⅛-in. thickness); ts, 3000-10,000 psi; compressive, 5000-30,000 psi; moisture absorption, low; produced in color; shatterproof; sp gr, 1.27-1.37; transparent, translucent and opaque; machinability, good; soluble in keytones esters, softened or slightly soluble in alcohol. For knobs, dials, controls, wheels, electrical insulation, shields, etc.

1 - 3 - - - - - 9 -
Ethyl cellulose; thermoplastic; furnished in powder for molding and extruding. Abrasion resistance, medium; resists corrosion caused by weak acids and all alkalies; heat resistant to 140-200 deg F; flexibility, low; dielectric strength for ⅛-in. thickness, 400-700; ts, 2000-9000 psi; compressive, 8000-20,000 psi; moisture absorption, low; produced in color; shatterproof; sp gr, 1.07-1.18; transparent, translucent or opaque; machinability, good. For knobs, controls, trim, nameplates, etc.

- - - - - 5 - - - 9 10
Polystyrene; thermoplastic; furnished in powder for molding and extruding. Abrasion resistance, medium; resists corrosion caused by alkalies and weak acids; heat resistant to 150-190 deg F; flexibility, low, dielectric strength, 500-700 volts per mil; ts, 5000-9000 psi; compressive, 1105-15,000 psi; moisture absorption, low; produced in color; sp gr, 1.05-1.07; transparent, translucent and opaque; soluble in benzene. For use as knobs, dials, controls, wheels, electrical insulation shields, etc.

1 - - - 5 - - - 9 -
Vinyl; thermoplastic; furnished in powder for molding and extruding. Abrasion resistance, high; resists corrosion caused by alkalies and acids; heat resistant to 150 deg F; flexibility, low; dielectric strength, 450 volts per mil; ts, 1000-9000 psi; moisture absorption, low; produced in color; shatterproof; sp gr, 1.2-1.6; transparent, translucent or opaque; machinability, good. Used for knobs, dials, controls, wheels, electrical insulation, shields, etc.

1 - 3 - - - - - - 10
CHEMIGUM—Goodyear Tire & Rubber Co., Akron 16, O. 70-30 butadiene acrylonitril synthetic rubber; thermosetting and thermo-

1-Corrosion resistant
2-High heat resistant
3-Impact resistant
4-High tensile strength
5-High dielectric strength
6-Nonflammable
7-Takes high polish
8-Translucent
9-Available in colors
10-Low moisture absorption

plastic; for molding, stamping and extruding into parts. Abrasion resistance, high; resists corrosion caused by acids, alkalies, oils and solvents; flexibility, medium and high; ts, 3500 psi; moisture absorption, low; available in color; shatterproof; opaque; soluble in ketones and chlorinated solvents. For valves, gaskets, seals, vibration dampeners, hose tubing, etc.

1 2 - - 5 - - - - - -
CIBANITE—Ciba Products Corp., Hoboken, N. J. Aniline formaldehyde resin, thermoplastic; furnished in powder form for molding and machining. Abrasion-resistant; resists corrosion caused by alkalies; heat-resistant up to 247 deg F; flexibility, low; dielectric strength, 400-600 volts per mil; ts, 8200 psi; compressive, 24,000; moisture absorption, .01-.08 per cent; available in natural brown color; impact strength, .30 ft lb per in.; sp gr, 1.22-1.25; translucent; machinability, good. For use where good strength with electrical properties are required, such as for stator insulation, tube bases, coil forms, terminal boards, strips and blocks.

1 - - - - - - - - - 10
CLEARSEAL—Cleaveland Laboratories & Mfg. Co. Inc., Peapack, N. J. Vinyl resin applied to fabric and paper, also other synthetic rubbers and covers; both thermosetting and thermoplastic, in sheet and laminated form; for molding, sewing and cementing. Abrasion resistance, high (for fabric); resists corrosion caused by acids, alkali, salts and gasoline; heat resistant to 175 deg F; flexibility, high or changed as desired); moisture absorption, may be varied as required; available in any color; transparent, translucent or opaque. For machine covers, bellows, oil or grease retaining jackets, etc.

1 2 - - - - - - - - 10
COLONIAL CERAMICS—The Colonial Insulator Co., Akron, O. Ceramic base material for molding, casting, stamping and extruding. Has high abrasion resistance; resists corrosion caused by most acids and alkalies; heat-resistant to 2000 deg F; moisture absorption, low; available in colors, opaque; machinability, poor.

- - - 4 - 6 - 8 - -
COMPAR—Resistoflex Corp., Belleville, N. J. Compounded, modified polyvinyl alcohol base material; furnished in sheets, rods or tubes, for molding and extruding. Abrasion resistance, high; heat resistant to 250 deg F; flexibility, high; ts, 2500-5200 psi; moisture absorption, medium; sp gr, 1.26; translucent; hardness, 65-100. For flexible hose connections and assemblies for low and medium pressure hydraulic systems, and lubricating systems. Gaskets and molded parts.

See advertisement, Page 256

- - 3 4 - - - - - - -
CO-RO-LITE—Columbian Rope Co., Auburn, N. Y. Phenolic base resin material, furnished in sheet form for molding into parts. Abrasion resistance, high; heat-resistant up to 350 deg F; flexibility, medium; ts, 11,000 psi; flammable; can be highly polished; opaque; and can be produced in color. Used for cams, gears, bobbin heads, bearings, tension and compression members, etc.

1 - 3 - - 6 - - - - -
COTTONLEATHER Fabric — Southern Friction Materials Co., Charlotte, N. C. Cotton fabric base with resinous impregnation, thermosetting; furnished in sheets for stamping. Abrasion resistance, high; heat-resistant to 250 deg F; flexibility, medium; dielectric strength, low; ts 2000 lb modulus of rupture; moisture absorption, low; takes color; shatterproof; sp gr, .96-1.04; opaque; machinability, fair. For pulleys, frictions, pads, shims, etc.

D

- - 3 - - 6 7 - - -
DENSEWOOD—Densewood Corp., Elkhorn, Wis. A wood-base, thermoplastic material to be machined into parts. Abrasion resistance, medium; heat-resistant to 350 deg F; flexibility, low; ts, 18,000 psi; compressive, 14,400 psi; moisture absorption, low; nonflammable; sp gr, 1.15; opaque; can be highly polished. Used for pulleys, rollers, pushbuttons, etc.

- - 3 4 - - 7 - - -
DENS-TRECH — Technical Ply-Woods, Chicago 1. High-pressure plywood; thermoplastic; furnished in sheet form for machining into parts. Abrasion resistance, medium; resists corrosion caused by termites and moisture; heat-resistant to 350 deg F; flexibility, medium; tensile and compressive strengths depend on construction; moisture absorption depends on treatment; nonshatterproof; machinability, good.

- - - 4 5 - - - 9 -
DIAMOND — Continental-Diamond Fibre Co., Newark, Del. Vulcanized fiber, bone-like material; furnished in sheets, rods and tubes, for machining, sawing or punching into parts; high tensile and dielectric strengths; low specific gravity; tough; pliable; impact-resistant. Used for insulating members, bobbin heads, etc.

- - 3 4 - - - - - 10
DIE-TECH—Technical Ply-Woods, Chicago 1. Wood and phenolic base plywood; thermoplastic; furnished in sheet form for machining into parts. Abrasion resistance, medium; resists corrosion caused by termites and moisture; heat-resistant to 350 deg F; flexibility, medium; tensile and compressive strengths depend on construction; moisture absorption depends on treatment; nonshatterproof; machinability, good.

- - - - - 5 - - - - 10
DILECTENE—Continental Diamond Fibre Co., Newark, Del. Insulating material available in two grades:

No. 100; pure aniline-formaldehyde synthetic resin, which contains no cellulosic filling materials; highly resistant to moisture and electrically very stable; sp gr, 1.21; ts, 10,-500 psi; flexural strength, 20,000 psi; compression strength, 20,000 psi; and dielectric strength, 640-650 volts per mil.

- - - - 4 5 - - - - 10
DILECTO — Continental-Diamond Fibre Co., Newark, Del. Phenolic base, thermosetting; furnished in laminated sheets, rods and tubes, for machining or stamping into parts; dielectric strength 270-500 volts per mil; low moisture absorption; ts, 10,000-25,000 psi; corrosion-resistant; heat resistance, 290 deg F; available in colors; resistant to shock; takes high polish; impact-resistant; insoluble. Used for electrical, thermal and mechanical insulating parts.

1 - 3 - 5 - - - - - -
DUFELT—Felters Co., Boston. Laminated felt and Neoprene. Various thicknesses and lamination arrangements. Corrosion-resistant. Used for washers and strips for oil and grease retention where conditions are too exacting for use of plain felt. Petroleum-resistant.

See advertisement, Page 284

DUFLEX—Harris Products Co., Cleveland. Rubber and metal vibration insulators, mounts for aircraft, automotive, mobile military equipment and shins. Applicable to any equipment where vibration is met, such as engines, printing presses, motors, pumps, machines of all types, radio equipment, instruments, etc.

1 - - 3 - - - 7 - - -
DUOLITE—Pittsburgh Plate Glass Co., Pittsburgh. Laminated window glass with Vinal plastic binder; furnished in flat and bent sheets; corrosion and abrasion resistance, high; heat-resistant to 180 deg F; flexibility, low; moisture absorption, low; nonflammable; shatterproof; transparent; highly polished. For windows which need not be optically perfect.

1 - 3 - - - 7 - - -
DUPLATE—Pittsburgh Plate Glass Co., Pittsburgh. Laminated plate glass and Vinal plastic binder, furnished in flat and bent sheets; corrosion and abrasion resistance, high; heat-resistant to 180 deg F; flexibility, low; moisture absorption, low; nonflammable; shatter-resistant; transparent; highly polished. For shatter-resistant windows, including those of high optical quality.

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DUPONT POLYVINYL Acetate—E. I. du Pont de Nemours & Co., Wilmington 98, Del. Thermoplastic; supplied in solid beads of low, medium and high viscosity for molding or casting, in solution (50 per cent in methanol), and as water emulsion. Soluble in common organic solvents for use as adhesive, compatible with resins, cellulose derivatives and chlorinated rubber. Used as adhesive, binding agent, also as protective coating on machine parts.

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DURALON—The U. S. Stoneware Co., Akron, O. Furane base; thermoplastic; for casting, machining, surface coating or laminating; abrasion resistance, high; resists corrosion caused by chemical or solvent action; heat-resistant to 400 deg F; flexibility, medium; dielectric strength, over 5000 volts per mil; moisture absorption, low; produced in black; shatterproof with certain fillers and in certain shapes; sp gr, 1.1; opaque; machinability, good; hardness, 110 Rockwell M (depending on cure); soluble in nothing after cure, except strong oxidizing acids. For light metal stamping dies, solvent proof coatings, cast electrical insulating part, etc.

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DURASHIELD—Plastic Fabricators Inc., San Francisco. Cellulose acetate thermoplastic which can be fabricated to any size, shape, thickness or color; can be die cut and will permit punching of holes in accordance with specifications. Abrasion resistance, high; resists corrosion caused by salt spray and moisture; heat-resistant to 170 deg F; flexibility, high; shatterproof; moisture absorption, low; transparent, translucent and opaque. For nameplates.

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DUREZ—Durez Plastics & Chemicals Inc., North Tonawanda, N. Y.

Molding powders; phenolic base, thermosetting, for molding into parts; corrosion-resistant highly polished; low moisture absorption; heat resistance, 350-550 deg F; ts, 4000-7000 psi; available in colors; shock and abrasion resistant. Used for housings, handles, bases, knobs, electrical parts, small gears, frames, hoods, etc.

Liquid resin (No. 7421A); cast at low temperatures; compressive strength, 15,000-20,000 psi; impact strength (energy to brake ½ x ½-in. bar) .11-.15 ft lb Izod; flexural strength, 7000-9000 psi; thermosetting; can be set by baking at temperatures above 100 deg C.

1 - 3 - 5 - - - - - -
DURITE—Durite Plastics Inc., Frankford Sta., P. O., Philadelphia. Phenol-furfural and phenol-formaldehyde synthetic resins, heat-setting; available in crushed, pulverized or liquid form, for bonding hot or cold-molding compound, plywood, veneer, cements, abrasive articles, etc.; or in powder form for hot press-molding; possesses high heat and shock resistance; high tensile and dielectric strengths; corrosion resistance; nonflammability and low moisture absorption. Used for cabinets, housings, handles, keys, knobs, automotive ignition, hand wheels, terminals, tank periscopes, ordnance range finders, etc.

E

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EBROK—The Richardson Co., Melrose Park, Ill. Acid-resisting bituminous plastic for specific requirements including such parts as battery containers.

See advertisement, Page 254

- 2 - 4 - 6 - - - -
EEL-SLIP—Johns-Manville, New York 16. Asbestos fiber, graphite and rubber compound; heat-resistant; high tensile strength; nonflammable. Used for bearings, suction box covers, etc.

1-Corrosion resistant
2-High heat resistant
3-Impact resistant
4-High tensile strength
5-High dielectric strength
6-Nonflammable
7-Takes high polish
8-Translucent
9-Available in colors
10-Low moisture absorption

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ETHOCEL—The Dow Chemical Co., Midland, Mich. Plastic granules, thermoplastic; furnished in granular form for injection and extrusion molding; dielectric strength, 1500 volts per mil on .01-in. thickness; ts, 7000-8500 psi; compressive, 10-12,000 psi; heat resistance, 130-150 deg F; high impact strength at low temperature; low moisture absorption; good dimensional stability; available in color; sp gr, 1.10-1.25; translucent; opaque. Used where dimensional stability is required. Also furnished in sheeting.

See advertisement, Page 289

F

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FARLITE—Farley & Loetscher Mfg. Co., Dubuque, Ia. A series of nonmetallic materials, furnished in the following types:

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Phenolic and urea base, thermosetting materials, produced under the name "Farlite"; furnished in laminated sheets to 36 x 84; for machining and stamping into parts; corrosion-resistant; highly polished; low moisture absorption; impact-resistant; available in colors; ts. 6000-8000 psi; dielectric strength, to 700 volts per mil. Used for sawed or stamped flat parts for light machine members.

1 - 3 - 5 - - - - - -
Compreg; wood veneer (1/16 or ⅛-in.) impregnated with thermosetting synthetic resins before compressing. Thickness to 2 in.; for machining with same tools as for cast iron. Material is impact and corrosion-resistant; has low moisture absorption; ts, 30,000 psi; compressive, 20,000; good dimensional stability; modulus of rupture in bending, 35,-000 psi. Used for bearing plates, bolts, studs, propeller blades, instrument panels, mechanical spacers, etc.

1 - 3 4 - - - - - - -
Gear stock; fabric base, impregnated with thermosetting resins. Furnished in blanks of desired thickness; high moisture resistance; ts, to 11,000 psi; compressive, 39,500; flexural, to 20,000; and dielectric strength, to 700 volts per mil.

1 - 3 - - - - - - - 10
Safety tread; abrasive surface material bonded with phenol-formaldehyde resin under heat and pressure to metal, resinous sheet stock or wood. Abrasive material hardest known except diamond. Very coarse to fine. Waterproof, oil and greaseproof; nonslip; acid-resistant. No distortion less than 300 deg F.; furnished in sheets or fabricated form to specifications; molded to simple shapes. Used on buses, trains, ships, airplanes, stairways; catwalks and machine platforms.

1 2 - - - 6 - - - - -
FEATHERWEIGHT—Keasbey & Mattison Co., Ambler, Pa. Magnesia blocks, pipe covering and cemet. Combination of magnesia and asbestos in powder or molded form with exceptionally low thermal conductivity. Used as a thermal insulating material where temperature does not exceed 600 deg F.

1 - - - 5 - - - 9 -
FELTERS FELT—Felters Co., Boston. Nonwoven felts to SAE and other specifications. Available either in the piece or cut to customer's requirements. Used for pads, bumpers, anti-squeak and rattle parts, filters, polishing roll covering, shaft and bearing seals, etc. Petroleum-resistant.

See advertisement, Page 284

2 - 4 - 6 - - - - 10
FIBERGLAS—Owens-Corning Fiberglas Corp., Toledo, O.

Wool and textile: Three kinds of wool-type fibers: (1) for thermal and accoustical insulation, compressed to various densities, in form of bats, blankets, blocks, etc.; (2) for thin porous bonded mats; (3) for filter or aeration packs (coarse fibers). Two types of textile fibers—continuous filament and staple fiber—for service fabrics, chemical filtration, electrical insulation, reinforcement in laminates, plastics, etc. Basic properties; light weight, low thermal conductivity. Wool products have good sound absorption, resistant to moisture, individual fibers are incombustible, durable, sanitary, wide temperature range (from subzero to 1000 deg F).

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Thermal insulations include medium and high temperature blocks, low temperature (asphalt-enclosed) blocks, pipe insulations, metal mesh blankets, etc., for all industrial equipment applications.

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Electrical insulations for magnet wire, motors, generators, transformers—varnished cloths used for high temperature cambric applications; inorganic backing and reinforcement in mica combinations; for producing electrical laminates; for high temperature electrical adhesive tape. Tapes used for binding coils and other parts to be impregnated after wrapping; various electrical applications. Electrical tying cord for binding coils in generators and armatures, in transformers and similar static applications. Braided sleevings are used for lead wires in motors and transformers and similar applications.

1 2 - - - - - - - - 10
Industrial textiles for high temperature pipe lagging, welding curtains, and chemical filter cloths.

Dust-stop air-filters; used wherever air is moved mechanically in ventilating, heating and air-conditioning systems and in forced warm air furnaces.

See advertisement, Page 290

1 - - 4 5 - - - - -
FIBESTOS—Monsanto Chemical Co., Plastics Div., Springfield, Mass. Cellulose-acetate; thermoplastic; furnished in sheet, laminated and powder forms or rods and tubes, for molding, machining, stamping or swaging into parts; resistant to corrosion; transparent; available in colors; flexible; tough; high polish; dielectric strength, 290-600 volts per mil; ts, 5500-10,000 psi. Used for safety glass, and compressible shims, couplings, gaskets, electrically insulated knobs and handles, light diffusing panels, and molded shapes of all types.

- 2 - - - - - - - - -
FIBRON—Plastic Tape—Irvington Varnish & Insulator Co., Irvington, N. J. Heat-sealing, flame-resistant plastic tape for insulating and protecting against abuse and corrosion wires, cables and electrical equipment; suitable also for splicing electrical cables and for covering piping and equipment exposed to acids, alkalies, moisture, oil and grease. Dielectric strength, 1000 volts per mil for tape of .012-in. thickness; ts, 17,000 psi.

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FIDELITY Felt—Fidelity Felt & Mfg. Co., Philadelphia 40. Felt furnished in sheets for stamping. Used for washers, gaskets and strips for oil retention, reducing vibration, dust seals, etc.

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FIRECRETE—Johns-Manville, New York 16. A castable refractory for furnace covers and bottoms, door linings, special shapes and many other types of monolithic refractory construction. Furnished in three grades; Standard Firecrete for temperatures up to 2400 deg F; High Temperature Firecrete up to 2800 deg F; and Light Weight Firecrete up to 2200 deg F.

1 - 3 - - - - - - -
FLEXSEAL—Pittsburgh Plate Glass Co., Pittsburgh. Laminated plate glass with extended Vinal plastic edge, furnished in flat and bent sheets; corrosion and abrasion resistance, high; heat-resistant to 180 deg F; flexibility, medium; moisture absorption, low; shatterproof; transparent; highly polished; flexible edge simplifies installation. For windows having nonrigid frames or windows requiring an airtight edge seal.

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FORMICA—Formica Insulation Co., Cincinnati. Resinous base, thermosetting; furnished in laminated form, for machining or stamping into parts; corrosion-resistant; tensile strength is slightly less than cast iron; high dielectric strength; absorbs no oil; changes in dimensions only slightly as the result of moisture absorption. Used for insulating washers and bushings, punched parts in switches, automotive starting systems and all types of heavy-duty gears.

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Grade C; phenolic laminated fabric; thermosetting; furnished in laminated form and in rods or tubes; can be highly polished; corrosion-resistant to acids and salts, not alkalies; flexible in thin sections; dielectric strength, 200 volts per mil in 1/16-in. thick; ts, 10,000 psi; heat resistance, 300 deg F. Used for silent gears.

- 2 3 - - - - - - - -
Grade FF-54; melamine resin, glass fabric base, thermosetting material furnished in rods or tubes and in laminated form for molding into parts; abrasion resistance high; resists corrosion caused by mild alkali; heat resistant to 300 deg F; flame-resistant; dielectric strength, 500 volts per mil; ts, 25,000 psi; sp gr, 1.95; opaque. For panelboards and other applications requiring good arc resistance and flame resistance.

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Grade MF; aniline-formaldehyde-glass thermosetting material; furnished in rods, tubes and laminated sheets, for molding, machining or stamping into parts; corrosion-resistant; heat-resistant to 280 deg F; flexibility, medium; ts, 14,000 psi; compressive, 20,000 psi; dielectric strength, 450 volts per mil; moisture absorption, low; nonflammable; shatterproof; opaque. For low-power loss insulation, to replace glass and porcelain parts in antenna mast bases, molded insulators, spacers, washers, etc.

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Grade XX; phenolic laminated paper; thermosetting; furnished in laminated form and in rods or tubes; can be highly polished; dielectric strength, 500 volts per mil; ts, 12,-000 psi; heat resistance, 300 deg F; available in natural and black; low moisture absorption. Used for insulation for electrical equipment.

See advertisement, Page 161

1 - - - - - - - - 9 10
FV—Irvington Varnish & Insulator Co., Irvington, N. J. Flexible lacquered tubing for electrical insulation; meets ASTM and VTA standards for grade A-2 flexible varnished tubing; resistant to aging, oil, moisture, acid vapors, weak alkalies. Obtainable in five colors.

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FYBEROID—Wilmington Fibre Specialty Co., Wilmington 99 Del. Paper base; furnished in sheet form, for machining or stamping into parts; dielectric strength, 200-400 volts per mil; ts, 5000-8000 psi; flexible; abrasion and corrosion-resistant. Used for insulation on motors, generators, automotive ignition starters, etc.

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FYBR-TECH—Technical Ply-woods, Chicago 1. Fiber and wood base plywood; thermoplastic; furnished in sheet form for molding. Abrasion resistance, medium; resists corrosion caused by termites and moisture; heat-resistant to 350 deg F; flexibility, medium; high dielectric strength; tensile and compressive strengths depend on construction; moisture absorption depends on treatment; available in gray, red, green or white fiber faces; non-shatterproof; machinability, good.

G

- 2 3 - 5 - - - - -
GARIT—Garfield Mfg. Co., Garfield, N. J. Thermosetting, cold-molded plastic; corrosion-resistant; dielectric strength, 50-60 volts per mil; ts, 1200 psi; heat resistance, 500 deg F, moisture absorption, 2 per cent, nonflammable; compressive strength, 7500 psi. Used for molded insulation for electrical equipment.

- - - 4 - - - - - -
GASKOFELT—Western Felt Works, Chicago. Compact combination of felt with an oil-resistant rubber compound of great density

1-Corrosion resistant | 2-High heat resistant | 3-Impact resistant | 4-High tensile strength | 5-High dielectric strength | 6-Nonflammable | 7-Takes high polish | 8-Translucent | 9-Available in colors | 10-Low moisture absorption

and high tensile strength. Used for gasketing in connection with oil, steam, hot or cold water; temperatures up to 250 deg F; pressures up to 225 lb.

See advertisement, Page 304

1 - 3 4 - - - - - - -
GEMFLEX—Gemloid Corp., Elmhurst, L. I., N. Y. Vinylite tubing and gasketing; thermoplastic material furnished in rods or tubes, for molding into parts; odorless, nontoxic and very slow-burning; exceptional resistance to oil moisture and most chemicals; strong and tough at lower than freezing temperatures; strong resistance to abrasion; high fatigue strength; unusual flexibility. For insulating, gasketing, etc.

- - 3 4 5 - - - - -
GEMLITE—Gemloid Corp., Elmhurst, L. I., N. Y. Acrylic butyrate, thermoplastic; furnished in laminated sheet, rods or tubes, for molding and extruding; corrosion and impact-resistant; high tensile and dielectric strengths; nonflammable; takes high polish; translucent; available in colors; moisture absorption, low. Used for handles, knobs, controls, etc

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GEMLOID—Gemloid Corp., Elmhurst, L. I., N. Y. Thermoplastic material, furnished in sheet and laminated form for stamping into parts; abrasion resistance, medium; heat resistance for thermoplastics is 175 deg F and for thermosetting type, 400 deg F; ts, 4000-6000 psi; moisture absorption, low; nonflammable. Used for replacing metal nameplates.

- - 3 - - - - - - -
GENERAL Rubber—The General Tire & Rubber Co., Mechanical Goods Div., Wabash, Ind. All types of rubber molded and extruded. For gaskets, grommets, bushings, rings, pump diaphragms, washers, casters, extruded seals, channel strips, glass-run channels, etc.

See advertisement, Page 252

1 2 - - - - - - - -
GEON—B. F. Goodrich Co., Akron, O. Polyvinyl resins in several types.

Types 100, 101, 102; special vinyl chloride polymers characterized by their thermal and light stability, toughness and chemical inertness. Type 101 is used for electrical applications such as wire and cable insulation, while 102 is adaptable to general uses.

Type 200, etc.; combine increased solubility and thermoplasticity with exceptional stability, chemical resistance and wide temperature range. Their resistance to hydrolysis by boiling water or even hot alkali is outstanding; also have unusual stability to light and heat.

Can be processed in many ways including injection and compression molding, extruding, calendering, solution coating and film casting. Compositions vary from rigid thermoplastic to very soft jelly. Available in powder, ready-to-use form as granules or sheets. Used for electrical insulation, automotive and aircraft tubing.

1 2 - - 5 - - - - -
GR-I (Butyl Rubber)—Stanco Distributors Inc., New York 4. Synthetic rubber, isobutylene-diolefin polymer; vulcanizable by the same process as used for natural rubber; furnished in sheets for molding or extruding into parts; abrasion resistance, medium; resists corrosion caused by acids and alkalis; heat-resistant to 300 degrees Fahr.; flexibility, high; dielectric constant, 2.1 at 1000 cycles; tensile strength, 3400 lb per sq in.; moisture absorption, low; specific gravity, .91; translucent; used for machine mountings, chemical equipment, electrical insulation, etc.

1 2 - - - - - - - -
GRAPHICELL—National Carbon Co. Inc., New York 17. Porous graphite, available in plates, tubes and rods; uniform high porosity and small pore size; easily machined and fabricated into shapes; resistant to acids and alkalies; not subject to fracture and spalling from thermal shock; resistant to oxidation; high electrical conductivity. For filtration and gas dispersion.

1 2 - - - - - - - -
GRAPHITAR—United States Graphite Co., Saginaw, Mich. Carbon-graphite material used for bearings, thrust washers, seals, rotor vanes, etc., made in several grades of which the following is typical: compressive strength, 22,000 psi; apparent density (g per cu cm), 1.77; transverse breaking strength, 10,500 psi; scleroscope hardness, 85; coefficient of thermal expansion 75-620 deg F (in per in per deg F), .0000017.

See advertisement, Page 251

1 2 - - 5 - - - - -
GUMMON—Garfield Mfg. Co., Garfield, N. J. Black, cold-molded; corrosion and heat-resistant (450 deg F); high dielectric strength; high polish; resistant to hot oil. Will not shrink, crack, warp or deteriorate with age; takes high polish; nonflammable. Used for insulated parts, etc.

H

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HARVEL Insulating Varnishes—Irvington Varnish & Insulator Co., Irvington, N. J. Special phenol-formaldehyde, polymerization type varnishes with exceptional penetrating power, excellent electrical properties; noncorrosive; unusual resistance to acids, dilute alkalies, moisture, lubricating and transformer oil; save baking time required: harden by polymerization rather than oxidation and cure to infusible nonthermoplastic state. For use with any type of insulation. Also oleo-resinous types in clear and black, air-drying, baking.

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HARVEL Oil Stop—Irvington Varnish & Insulator Co., Irvington, N. J. Oilproof, waterproof, heat-resistant, phenol-aldehyde used in splicing electrical cables; to seal and insulate electrical coils. Applied as a viscous liquid, it hardens by polymerization to an infusible, nonthermoplastic state; adheres to rubber, oil-impregnated paper, varnished cambric, fiber, bakelite and copper.

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HASKELITE—Haskelite Mfg. Corp., Grand Rapids 2, Mich. Resin-bonded plywood; light weight; high strength; elastic; hard; bendable into desired forms and shapes. Used for airplanes, buses, street cars, railways, radio cabinets and speakers, passenger cars, landing, PT and assault boats, etc.

- 2 - - 5 - - - - 10
HEMIT — Garfield Mfg. Co., Garfield, N. J. Cold-molded, gray-white refractory material; corrosion-resistant; heat resistance 1500-1750 deg F; low moisture absorption when impregnated; high dielectric strength; nonflammable. Used for interior parts of heating devices, or where a molded part must withstand an arc.

- 2 3 4 - - - - - -
HERCULITE—Pittsburgh Plate Glass Co., Pittsburgh. Tempered or heat-treated plate glass, furnished in flat and bent sheets; corrosion and abrasion resistance, high; heat-resistant to 650 deg F; flexibility, medium; ts, 29,-500 psi; moisture absorption, low; nonflammable; sp gr, 2.52; transparent; highly polished. For use as windows or any glass application requiring unusual strength.

1 2 - 4 5 - - - - 10
HYCAR—The Hycar Chemical Co., Akron, O. Vulcanizable types of synthetic rubbers of butadiene base furnished in crude sheet form to be compounded into any type of stock desired for further processing by molding, extruding, calendering, etc.

1 2 - 4 - - - - - -
Type OR-15 (oil-resistant); vulcanizable synthetic rubber, butadiene-acrylonitrile copolymer; furnished in sheet form; for molding, extruding and calendering; excellent oil, heat, abrasion and aging resistance; excellent flex life; ts, 2500-4500 psi; dielectric strength, 500 volts per mil; moisture absorption, medium; may be compounded in colors. Used for all resilient parts.

1 2 - 4 - - - - - -
Type OR-25 (oil-resistant); vulcanizable synthetic rubber, butadiene-acrylonitrile copolymer; furnished in sheet form; for molding, extruding and calendering; abrasion resistance, high; resists corrosion caused by petroleum products; heat-resistant to 300 deg. F; flexibility, high; dielectric strength, 500 volts per mil; ts, 2000-3500 psi; moisture absorption, low. May be compounded in colors.

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Type OS-10 (oil-soluble); vulcanizable synthetic rubber, butadiene-styrene copolymer; furnished in sheets; for molding, extruding and calendering; flexibility, high; ts, 2000-3000 psi; moisture absorption, low; takes color. For abrasive wheels, electrical insulation, and general replacement for natural rubber.

All types used for gaskets, tubing, vibration insulators, packings, hose, printing rollers and blankets, wire covering and jacketing, and any other general type of application where resilient materials are required. All can be compounded to bonehard (Ebonars) with a 100 deg F higher softening point than obtainable with natural hard rubber. All types also available in latex state for spreading, dipping and coating.

See advertisement, Page 144

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HYFLEX—Irvington Varnish & Insulator Co., Irvington, N. J. Flexible, rubber-like extruded plastic tubing; has excellent abrasion resistance; does not become brittle at temperatures as low as —50 deg F; obtainable in six opaque colors; dielectric strength, 1200 volts per mil (dry), 1000 volts per mil (wet), for tubing of wall thickness approximately .02-in.; ts, 3000 psi; good chemical stability.

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HY-TEMP—Keasbey & Mattison Co., Ambler, Pa. Diatomaceous earth and asbestos base; combination heat-insulating blocks, cements and pipe covering; furnished in powder or molded form; high heat resistance; low moisture absorption; nonflammable; and low thermal conductivity. Used for thermal insulation up to 1900 degrees Fahr.

I

1 - - - 5 6 - - - -
ILLINOIS Chemical Porcelain—Illinois Electric Porcelain Co., Macomb, Ill. Furnished in rods or tubes; for molding, casting, machining and extruding; resists corrosion caused by all chemicals except hydrofluoric acid; heat-resistant to 250 deg F; flexibility, low; ts, 6000-8000 psi; compressive, 100,000; sp gr, 2.4-2.5; opaque; machinability, good; for chemical piping.

- - - - 5 6 - - - 10
INCELOID—American Products Mfg. Co., (Inceloid Co. Inc., subsidiary) New Orleans. Cellulose derivative, thermoplastic; furnished in sheet and laminated form for casting into parts; corrosion and heat-resistant; can be highly polished; flexible; high dielectric strength; low moisture absorption, available in colors; transparent; shatterproof. Used for electrical insulation, laminating work, cover shields, etc.

- - - 4 5 6 - - - -
INDUR—Reilly Tar & Chemical Corp., Indianapolis. Phenolic base, thermosetting; furnished in powder form, for molding into parts; ts, 8560 psi; high dielectric strength; nonflammable; low moisture absorption; high heat resistance; corrosion and abrasion-resistant; available in colors; flexibility, medium; sp gr, 1.37±. Used for instruments and machine accessories including insulating panels, knobs and handles, control levers, gears, etc.

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INDUR VARNISH — Reilly Tar & Chemical Corp., Indianapolis. Phenolic base, thermosetting; for molding into parts; high dielectric and tensile strengths; nonflammable;

1-Corrosion resistant | 2-High heat resistant | 3-Impact resistant | 4-High tensile strength | 5-High dielectric strength | 6-Nonflammable | 7-Takes high polish | 8-Translucent | 9-Available in colors | 10-Low moisture absorption

transparent; corrosion and high heat-resistant; impact-resistant; and low moisture absorption. Used for laminated gears.

1 2 - - - - - - - - 10
INSULKOTE — Johns-Manville, New York 16. Weatherproof, heat-resistant coating for use over insulation of ducts and other exposed equipment.

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INSUROK—The Richardson Co., Melrose Park, Ill.

Thermosetting type; furnished in laminated sheets, rods and tubes for machining into parts, or as finished molded parts; corrosion-resistant; low moisture absorption; high tensile strength; resistant to shock; comparatively low specific gravity. Used for gears, bearings, electrical insulation. Available in different grades.

Thermoplastic type; furnished in molded parts; high dielectric strength; low moisture absorption; high tensile strength; low specific gravity. Available in color.

Translucent type; urea or phenolic base, thermosetting; in laminated sheets and fabricated parts, for instrument dials, etc. Material is translucent, does not support combustion, and has low moisture absorption.

See advertisement, Page 254

1 - - - 5 - - - - - -
IRVINGTON—Irvington Varnish & Insulator Co., Irvington, N. J. Varnished fabrics; varnished cambric, canvas, cotton, duck, Fiberglas, silk, Nylon, rayon and SIC, thin cotton (alternates for silk). Varnished papers; ranging from thin condenser tissues to heavy fibrous types.

Insulating varnishes; synthetic, internal-drying clear insulating, oleo-resinous type varnishes; clear or black, baking, air drying; black air-drying; flashing or baking core-plate; clear or black oilproof finishing varnishes. Wide selection to meet ordinary and special requirements.

Plastic marker insulators; extruded plastic tubing sleeves, marked to specifications; serve both as wire markers and lug insulators; high dielectric strength; resistant to heat, acids, alkalies, oil and many solvents; do not support combustion. Obtainable in numerous color combinations, and in standard tubing sizes.

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Transformer lead tubing; made to specifications, consisting of several layers of varnished cambric over which saturated braid has been drawn; assembly is dipped in varnish and thoroughly baked.

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Varnished markers; short lengths of varnished tubing marked to specifications. Used to identify leads; inside-and-out coatings resist oil, gasoline, washing down of motors, high engine temperatures.

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IRV-O-LITE—Irvington Varnish & Insulator Co., Irvington, N. J. Flexible extruded plastic tubing; high dielectric and tensile strength; resistance to tearing, abrasion, acids, alkalies, gasoline and other petroleum solvents, and most coal-tar solvents; does not support combustion; low moisture absorption; smooth inside and outside walls; chiefly used for wiring and lug insulation or as conduit; superior to rubber or metal tubing for specific applications. Two types, both available in six opaque colors: Type XTE-30 for general all-around usage, and XTE-130 for applications involving higher temperatures, greater dielectric strength and higher tensile strength.

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IRV-O-SLOT—Irvington Varnish & Insulator Co., Irvington, N. J. Stator or armature slot insulation; thinnest types are resin-coated papers, others consist of varnished fabric duplexed to fish or 100 per cent rag papers; flexible binding adhesive prevents separation during shaping and forming, contributes to insulating qualities. Obtainable in a wide variety of combinations and thicknesses in the form of sheets, tape and punchings.

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IRV-O-VOLT—Irvington Varnish & Insulator Co., Irvington, N. J. Flexible varnished inside-and-out tubing; obtainable in six colors. Braided cotton sleeving, treated with oleo-resinous varnishes.

Types A-1, B-1, C-1 and C-2; conform to ASTM and VTA specifications for similarly designated grades; inside varnish coating yields a smoother inside wall, speeding assemblies; greatly retards moisture absorption; eliminates feathering action of ordinary braid and wicking action when used in oil-filled transformers; provides margin of insulation protection should outside coating become chafed.

Type CT; special heavy-walled saturated sleeving.

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IVI-FLEX—Irvington Varnish & Insulator Co., Irvington, N. J. Flexible extruded plastic tubing, developed for use at extremely low temperatures; withstands a hammer blow at −70 deg F; can be pinched at −80 deg F; dielectric strength, 600 volts per mil, wet or dry; ts, 1000 psi; elongation at break, 400 per cent.

J

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JAMESTOWN Plywood—Jamestown Veneer & Plywood Corp., Jamestown, N. Y. Hot-pressed, resin-bonded plywood; thermosetting; furnished in sheets for machining. Abrasion resistance, low; resists corrosion caused by moisture; heat-resistant to 400 deg F; flexibility, low and medium; approx ts, 2000 psi; compressive, 250; produced in natural wood; largely shatterproof; sp gr, .45-.60; machinability, good.

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K.E.M.—Makalot Corp., Boston. Thermosetting molding nonphenolic compound; available in two forms—the standard containing no phenol, and the improved containing to 15 per cent phenol. With phenol, material is not as strong as the phenolics and takes slightly longer to cure at temperatures of approx 350 deg F. K.E.M. 15 per cent phenol is molded under same general conditions as the usual phenolics; also the same in appearance, finish and utility.

1 - 3 - - 6 - - - -
"K" FELT—American Felt Co., Glenville, Conn. Kapok felts to Air Corps Specification 16098, Types I and II. Material is corrosion-resistant, impact-resistant and nonflammable; for insulating, etc.

See advertisement, Page 302

1 2 - - - - - - 9 -
KGI—Kopp Glass Inc., Swissvale. Pa. Glass for marine, aviation, railroad and industrial applications. Types include technical glass, ultra-violet glass. heat-resisting glass, colored glass, crystal clear and opal glass.

See advertisement, Page 149

1 2 - - - - - - - -
KARBATE—National Carbon Co. Inc., New York 17. Carbon and graphite base, corrosion-resistant materials and impervious to seepage of liquids and gases under pressure.

No. 10 Series (11, 12, 18, etc.); carbon base materials.

No. 20 Series (21, 22, 28, etc.); graphite base materials.

Available in the form of brick, plates, tile, pipe, fittings, valves, pumps, heat exchangers. tower sections and tower accessories such as bubble caps, trays, distributor plates, etc.; highly resistant to reaction with most materials encountered in chemical manufacturing plants and chemical processes at the concentrations and temperatures ordinarily employed; resist action of all acids, alkalies and salt solutions except those of a highly oxidizing nature. No. 10 series have a lower thermal conductivity than the No. 20, while the latter are more resistant to oxidation.

1 - - - - - - - 9 -
KEM-POL—The Sherwin Williams Co., Cleveland. Vulcanizable polymer derived from vegetable oils, thermoplastic; furnished in sheets and liquid; for molding, extruding and calendering; ts, 300-500 psi; takes color; hardness 40-65. Available in four different grades.

No. 14; viscous liquid, amber in color; easily soluble in aliphatic and aromatic hydrocarbons; may be emulsified.

No. 54; of intermediate viscosity; tacky, semi-solid gel-like material; soluble same as above; may be cured, milled and molded.

No. 11; most viscous of the untreated polymers; tacky solid, and darker in color than two above, being ruby red; soluble with difficulty if at all; can be emulsified.

No. 11-41 MP; based on No. 11 and represents this polymer in a precured state; dry, cream to tan colored sheet, with only slight tack; may be worked directly on rubber mill, without pretreatment.

Used for hose, rolls, braided tubing, pads, gaskets, insulation, fabric coatings, tapes, beltings, etc.

1 - 3 - - - - - 9 -
KOROSEAL—B. F. Goodrich Co., Akron, O. Synthetic elastic; furnished in various consistencies from jelly to bone-like hardness; corrosion and shock resistant; nonflammable; available in colors. Jelly is used for making molds for plastic casts, but other compounds sold only as finished products. Superior to rubber in flexing, oxidation and penetration of moisture or gases; does not swell in oil. Available in molded and extruded forms; also applied as coating to paper and fabric.

- - 3 4 - - - - 9 -
KYS-ITE K-100—Keyes Fibre Co., Waterville, Me. Phenolic fiber base, thermosetting material; for molding into parts; abrasion resistance medium; resists corrosion caused by water, mild acid and alkali; flexibility, good; dielectric strength, 300-400 volts per mil; ts, 10,000-12,000 psi; compressive, 35,000; moisture absorption, medium; produced in medium and dark shades; shatterproof; sp gr, 1.39-1.45; opaque; machinability, good. For handwheels, small structural parts, and other machine parts.

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LAMICOID—Mica Insulator Co., New York. Phenolic and urea base thermosetting laminated sheets, rods and tubes and laminated form; for machining and stamping into parts; can be furnished highly polished or satin; abrasion resistance, high; heat-resistant to 250 deg F; moisture absorption, low; furnished in natural and black; impact-resistant; and has high dielectric strength. Used for gears, electrical and mechanical insulation, instruction charts, dials, etc.

1 - - - - - - - - 10
LAMINAC—American Cyanamid Co., New York. Thermosetting; liquid or paste, for laminating or casting. Abrasion resistance, high; resists corrosion caused by dilute acids, alkalies and brine; heat resistant to 212 deg F. without filler; 400 deg F with inorganic filler; flexibility, medium and high; dielectric strength, 520 (unfilled resin) volts per mil; ts, 6300 psi; compressive, 26,000 psi; moisture absorption, low; available in color; good impact strength; sp gr, 1.23 cured, 1.11 as liquid; transparent; machinability, good; and hardness, 91-94 Rockwell M.

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LAMITEX—Franklin Fibre-Lamitex Corp., Wilmington, Del. Laminated Bakelite phenolic, thermosetting; furnished in sheets, rods or tubes and in laminated form for machining. Abrasion resistance, high; heat resistant to 300 deg F; dielectric strength, 150-750 volts per mil; ts, 7500-12,500 psi; compressive, 32,900-38,000 psi; moisture absorption, .3-2.0; produced in black and natural; sp gr, 1.36-1.38; opaque. For all parts for radio radar, communication systems, airplanes, vessels, tanks, trucks, automobiles, etc.

1-Corrosion resistant
2-High heat resistant
3-Impact resistant
4-High tensile strength
5-High dielectric strength
6-Nonflammable
7-Takes high polish
8-Translucent
9-Available in colors
10-Low moisture absorption

- 2 - - 5 - - - - - 10
LENOXITE—Lenoxite Div., Lenox Inc., Trenton, N. J. Steatite, ceramic high-frequency insulating material, for molding, casting, machining and extruding; abrasion resistance, high; resists corrosion caused by all except hydrofluoric acids; heat-resistant to 1600 deg F; flexibility, low; dielectric strength, over 275 ASTM D116-42; ts, 10,000 psi; compressive, 75,000; moisture absorption, low; available in white and very light cream; semi-shatterproof; sp gr, 2.65; opaque; machinability, fair. For high-frequency radio insulators.

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LIGNOLITE—Marathon Chemical Co., Division of Marathon Paper Mills Co., Rothschild, Wis. Lignin plastic, furnished in laminated sheet form; for machining and stamping into parts; abrasion resistance, high; resists corrosion caused by acids, water and oil; heat-resistant up to 176 deg F; flexibility, low; dielectric strength, 500-900 volts per mil; ts, 7500-12,000 psi; compressive, 25,000-35,000; moisture absorption, low; available in black only; sp gr, 1.4; opaque. Used in the electrical field as switchboards, switch-bases, barriers, terminal strips, insulating spacers, washers, nameplates, conveyor guides, cabinets, etc. Licensee: Haskelite Mfg. Co., Grand Rapids, Mich.

1 - 3 - - - - - - - 10
LIGNUM-VITAE—Lignum-Vitae Products Corp., Jersey City, N. J. Natural tropical wood, 30 per cent volume is natural self-lubrication resin. Furnished in boards or logs for machining. Abrasion resistance, medium; resists corrosion caused by chemicals and light solutions; heat-resistant to 150 deg F; flexibility, low; moisture absorption, low; produced in natural color; sp gr, 1.17-1.3; opaque, hardness, 3-4 Moh's scale; soluble in alcohol and acetone. For bearings, bushings, rollers, guides, etc., where lubrication is difficult or impossible.

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LOALIN—Catalin Corp., New York. Polystyrene thermoplastic injection molding compound; excellent electrical properties; zero water absorption; sp gr, 1.06; crystal clear. Used for insulating.

1 - - - 5 - 7 8 - -
LOF—Libbey-Owens-Ford Glass Co., Toledo, O.

1 - - - - - - - 8 - -
Heat-absorbing plate glass; furnished in sheet form; abrasion resistance, high; corrosion-resistant; heat absorbing; flexibility, medium; dielectric strength, .204 kilovolts per mil; modulus of rupture, 6500 psi; moisture absorption, low; nonflammable; sp gr, 2.52; transparent; highly polished. For use where light transmission or vision is desired with insulation against solar radiation.

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Polished plate glass; furnished in flat, bent and laminated form; in clear and colors; sp gr, 2.52; highly polished; high dielectric strength; used for viewing windows.

See advertisement, Page 272

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LORD—Lord Mfg. Co., Erie, Pa. Rubber-bonded-to-metal, for a variety of uses including shear-type mountings for vibration isolation. Typical applications include aircraft, automotive, and marine engines; motors, pumps, compressors, general machinery, radio equipment, instruments etc., where vibration is encountered.

See advertisement, Page 166

- - 3 - - - - 8 9 -
LUCITE—E. I. du Pont de Nemours & Co. Inc., Wilmington 98, Del. Methyl-methacrylate base, thermoplastic; furnished in powder or sheets, rods and tubes, for molding and machining into parts; transparent, translucent; high dielectric strength; available in colors; resistant to shock; low moisture absorption; high polish; resistant to corrosion; ts, 5800-8000 psi; heat resistance, to 200 deg F. Used for panels, knobs, models, safety guards, dials and gage glasses, airplane enclosures and automatic parts.

1 - 3 - 5 - - - - 9 10
LUMARITH—Celanese Celluloid Corp., Plastics Div., Celanese Corp. of America, New York. Two types of cellulose acetate base, thermoplastics.

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One grade furnished in sheets, powder or rods and tubes; powders for compression, injection and extrusion molding. Available in colors; tensile strength, 3000-15,000 psi; dielectric strength 285-365 volts per mil for ⅛-in. thickness; high polish; flexible; resistant to shock and corrosion. Used as interior electrical parts, instruments, aircraft lever knobs, electrical insulation, steering wheels for aircraft and auto trucks, automotive door and window handles, gas mask lens, etc.

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Another is furnished in sheet and rolls or reels in thicknesses of .0007-0.20, for laminating, swedging, drawing or stamping into parts; abrasion and corrosion-resistant; flexible; dielectric strength, 700-2500 volts per mil; ts, 4500-11,000 psi; heat-resistant to 275 deg F; slow burning to nonflammable; transparent. Used for ammunition components, laminated slot insulation for motors; spirally wound tubing is used for insulating tool handles and interior electrical parts.

CA; cellulose-acetate base, specially developed for aircraft use in such applications as windows, cockpit enclosures, antennae housings, etc.; tough; has high clarity and optical uniformity; resistant to sunlight and can be heat-formed into three-dimensional shapes without surface impairment. Some of these materials are light stabilized, having greater weather resistance, and filtering out ultraviolet rays. It is abrasion-resistant.

1 - 3 - 5 - - - - - -
Type EC, ethyl cellulose, thermoplastic; furnished in powder form to be molded, machined and extruded; abrasion-resistant; resists corrosion caused by water, weak acids and alkalies; heat-resistant to 190 deg F; flexibility, medium; dielectric strength, 250-500 volts per mil; ts, 3000-9000 psi; compressive yield, 2000-5000 psi; low moisture absorption; available in colors; shatterproof; sp gr, 1.07-1.15; translucent; opaque. Used for aircraft venturi tubes, electrical and machinery parts.

See advertisement, Page 152

1 - - - 5 - - - - 10
LUSTRON—Monsanto Chemical Co., Plastics Div., Springfield, Mass. Polystyrene; thermoplastic; styrene base; furnished in powder for molding into parts: abrasion resistance, fair; can be highly polished; corrosion-resistant; dielectric strength, 500-700 volts per mil; ts, 6000-7000 psi; low moisture absorption; available in color; sp gr, 1.054-1.070 clear to opaque. Used for electrical insulating parts, etc.

1 - - - 5 - - - - 10
LUZERNE HARD RUBBER—The Luzerne Rubber Co., Trenton, N. J. Hard rubber, thermoplastic; furnished in sheets, rods or tubes, for molding and machining into parts: high polish; corrosion-resistant to acids and alkalies; dielectric strength 6 x 10^7 megohms constant at 28.8 deg C: ts, 3500-9000 psi; heat-resistant to 120 deg F; available in some colors: sp gr, 1.24: compressive strength, 8000-12,000 psi. Used for electrical, chemical, medical and other parts requiring high dielectric strength.

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MAKALOT—Makalot Corp., Boston. A large variety of compounds and resins including the following:

Phenol-formaldehyde resins and compounds; thermosetting; supplied in various forms, but mostly as a granular powder and in a wide range of flows to be molded under heat and pressure; for a wide variety of molding applications to best meet specific requirements.

Urea-formaldehyde resins: for use in the paper, leather and textile industries to improve strength, finish and resistance qualities of coatings, laminations, and impregnations.

- - 3 - 5 6 - - - 10
MELMAC—Plastics Division, American Cyanamid Co., New York.

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P-592; melamine-formaldehyde, thermosetting material; for molding into parts; abrasion-resistant; resists corrosion caused by water or solvents; heat-resistant to 300 deg F; flexibility, low; dielectric strength, 445 volts per mil; moisture absorption, low; opaque; nonflammable. Used where high arc resistance and high dielectric strength at elevated temperatures are required, such as aircraft ignition parts, circuit breakers, and cable connector inserts.

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P-3020; chopped, rag-filled, impact-resistance molding compounds. Used for heavy-duty circuit breakers.

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MICABOND — Continental-Diamond Fibre Co., Newark, Del. A built-up Mica material; furnished in sheets and tubing, for machining and forming into parts; heat-resistant; high dielectric and tensile strength; nonflammable; low moisture absorption. Used for V-rings, washers, segments and various special shapes.

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MICARTA—Westinghouse Electric & Mfg. Co., Trafford, Pa. Phenolic base, thermosetting; furnished in laminated sheet, rods or tubes; for molding, machining or stamping into parts; also special molded shapes; dielectric strength, 50-700 volts per mil depending upon grade; low moisture absorption; resistant to shock, corrosion; high polish; flexible; ts, 6000-16,000 psi; heat resistance, 230 F; nonflammable; sp gr, 1.32-1.8 depending upon grade. Used for bearings, gears, bushings, washers, thermal and electrical insulation and parts exposed to acids, alkalies and common solvents.

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MULTIPLATE — Pittsburgh Plate Glass Co., Pittsburgh. Multiple laminated plate glass, Vinyl plastic binder; furnished in cut sizes and shaped; corrosion and abrasion resistance, high; shatterproof; transparent; highly polished; stops bullets from .50 caliber machine guns and smaller arms. For protection against high velocity missile.

- 2 - - 5 - - - - 1
MYCALEX — General Electric Co., Pittsfield, Mass. Ceramic base thermoplastic; furnished in sheet, rods or tubes, or molded to specifications; for molding or machining into parts; abrasion resistance, moderate; can be highly polished; corrosion-resistant; dielectric strength, 350 volts per mil; ts, 5000-7000 psi; heat resistance, 600 deg F; low moisture absorption; nonflammable; available in gra only; opaque; compressive strength, 25-30,000 psi. Used for electrical insulation, switches, etc.

See advertisement, Page 293

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1 2 - - - - - 7 - -
NATIONAL CARBON — National Carbon Co., New York 17. Carbon or graphite in amorphous or graphite form; made in a variety of shapes; molded, extruded or machined into parts. In graphitic form carbon possesses excellent lubricating properties; highly resistant to most acids, alkalies and solvents. Used for sleeve bearings, packings, threaded parts, nozzles for corrosive liquids, pipe fittings, valves, tubes, tower sections, etc. for the chemical and process industries.

- - 3 4 5 - - - - -
NATIONAL FIBRE—National Vulcanized Fibre Co., Wilmington, Del. Converted cotton cellulose, chemically pure, tough horn-like material; furnished in hard or flexible forms in sheets, rolls, tubes, rods and fabricated shapes: high dielectric and mechanical strengths; resistant to abrasion and shock; easily formed and machined; light in weight. Used for gears, valve disks, gaskets, washers, bobbin heads, electrical insulation etc.

See advertiesment, Page 266

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NATIONAL SWITCH INSULATION — National Vulcanized Fibre Co., Wilmington, De

1-Corrosion resistant
2-High heat resistant
3-Impact resistant
4-High tensile strength
5-High dielectric strength
6-Nonflammable
7-Takes high polish
8-Translucent
9-Available in colors
10-Low moisture absorption

Combination laminated Bakelite core with vulcanized fiber surfaces; available in sheets and fabricated shapes; high tracking (arc) resistance combined with rigidity and minimum warpage; high dielectric and mechanical strengths; low moisture absorption; easily stamped and fabricated. Used in switches to support and insulate current-carrying parts.

See advertisement, Page 266

1 - - - 5 - - - - 10
NEILLITE—The Watertown Mfg. Co., Watertown, Conn. Phenolic base thermosetting material, furnished in powder form for molding into parts; abrasion resistance, medium; resists corrosion caused by weak acid and alkali; dielectric strength, 495 volts per mil; ts, 7000 psi; compressive 30,000 psi; moisture absorption, low; nonflammable; available in colors; sp gr, 1.36; shatterproof; for switch cases, spacers, etc.

1 2 - - - 6 - - - -
NEOPRENE—E. I. du Pont de Nemours & Co. Inc., Wilmington 98, Del. Chloroprene rubber; available as hose, wire, cable, sheets, tank linings, gaskets, packing, tubing, belting, diaphragms, industrial truck tires and molded goods. Used as binder for cork and asbestos. Is employed to impregnate or coat canvas, duck or other fabrics. Strength, abrasion resistance, resilience and elasticity of rubber; resistance to deterioration from contact with oils, greases, gasoline, heat, chemicals, sunlight and ozone; corrosion-resistant; will not support combustion; low moisture absorption; ts, 4000 psi; available in colors. Used for machine applications where rubber characteristics are required but where the product is to be subjected to deteriorating influences.

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NIGRUM—Bound Brook Oil-Less Bearing Co., Bound Brook, N. J. Impregnated hardwood bearings and washers; northern hard maple impregnated with specially prepared lubricant; used in loose pulleys, automotive, textile, foundry equipment, etc.

See advertisement, Page 302

1 - - - - - - - 9 -
NITRON—Monsanto Chemical Co., Plastics Div., Springfield, Mass. Cellulose-nitrate; thermoplastic; furnished in sheets, rods and tubes, or in laminated form, for machining, molding, stamping, swedging or blowing (steam) into parts; corrosion-resistant; translucent; available in colors; flexible; dielectric strength, 600-1200 volts per mil; ts, 5000-10,000 psi, low moisture absorption. Used for sight glasses, safety handles and structural models for strain study.

- - - - 6 7 - 9 -
NIXONITE—Nixon Nitration Works, Nixon, N. J. Cellulose acetate, resinous, thermoplastic; furnished in sheets, rods or tubes and powder for molding, machining, stamping and extruding into parts. Abrasion resistance, medium; resists corrosion caused by hydrocarbons, gasoline, benzol and oils; heat resistant to 215 deg F; flexibility, medium; dielectric strength, 1300 volts per mil; ts, 5500; compressive, 15-20,000 psi; moisture absorption, low; available in color; shatterproof; sp gr, 1.20-.127; transparent, translucent and opaque; machinability, fair; Bhn, 10-11.8. For knobs, control levers, shields, etc.

- 3 - - - - - 9 10
NIXONOID—Nixon Nitration Works, Nixon, N. J. Cellulose nitrate, resinous, thermoplastic; for molding, machining, stamping and extruding into parts. Abrasion resistance, medium; resists corrosion caused by water, hydrocarbons, diluted alkalies and acids; heat resistant to 160 deg F; flexible; dielectric strength, 300-500 volts per mil; ts, 6000-9000 psi; compressive, 20-30,000; moisture absorption, low; produced in color; shatterproof; sp gr, 1.39-1.45; transparent, translucent and opaque; machinability, good; Bhn, 8-11. For handles, knobs, nameplates, etc.

1 2 - - - - - - - 10
NYLON—E. I. du Pont de Nemours & Co. Inc., Wilmington 98, Del. Thermoplastic, furnished in flake for extrusion and coating, as monofilament for cutting up into parts, in powder for molding; high abrasion resistance; tough; high-service temperatures (380 deg F); resistant to many chemicals; very flexible; dielectric strength (volts per unit) 5 at 1000 cycles, 20 deg C; ts, 51,000 psi; melting point 264 deg C; nonflammable; produced in black and white; can be colored after molding; density, 1.14; translucent. Used for aircraft switch housings, electric coil spool, anemometer cups, brush bristles, and extruded electrical insulation.

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OHMOID—Wilmington Fibre Specialty Co., Wilmington 99, Del. Phenolic base, thermosetting; furnished in laminated sheets, rods and tubes, for machining or stamping into parts; dielectric strength, 200-700 volts per mil; moisture absorption, 2 per cent; insoluble in ordinary solvents; high polish; corrosion-resistant; ts, 10-14,000 psi; heat resistance, 250-300 deg F. Used for electric and mechanical insulation.

1 - 3 4 - - - - - -
ORCO—The Ohio Rubber Co., Willoughby, O. Mechanical molded and extruded rubber and synthetic rubber parts; also special processes for bonding rubber and synthetic rubbers to metals and other materials. High dielectric strength, and heat-resistant.

See advertisement, Page 155

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1 - - 4 5 - - - - -
PANELYTE—Panelyte Division, St. Regis Paper Co., New York. Laminated resinous thermosetting plastics in sheets, rods, tubes, structural forms and molded shapes; supplied in fabric, paper, wood or asbestos base grades; parts fabricated or semifabricated to print. Various grades characterized by high strength, light weight, good electrical properties, excellent heat resistance, and freedom from odor. Unaffected by solvents, dilute acids and alkalies. Outstanding machinability, punchability and dimensional stability. Used in aircraft for propellers and propeller parts, air deflectors for engines, skin, fairings, inter-compartment doors and for high "EI" molded flooring. Also for radio and other electrical insulation applications, gears, pinions and nonstressed or semistressed structural parts, and in refrigeration for trim and structural parts.

See advertisement, Page 265

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PARAPLEX—The Resinous Products & Chemical Co., Philadelphia 5. A group of alkyd resins, tough, rubbery; thermoplastic

X-100; can be vulcanized to give good tensile strength, elongation, resilience, oil resistance, low temperature flexibility; also can be molded, extruded or calendered. Defined as a vulcanizable resinous polyester, supplied as opaque slabs.

- - 3 4 5 - - - - -
PEERLESS — National Vulcanized Fibre Co., Wilmington, Del. Converted cotton cellulose, chemically pure, fish paper insulation; furnished in sheets and rolls; high dielectric strength combined with toughness, springiness and good bending properties. Used extensively for generator and motor insulation and various other electrical applications.

See advertisement, Page 266

1 - 3 - 5 - - - - - -
PENN Vulcanized Fibre—Penn Fibre & Specialty Co., Philadelphia. Paper base material, furnished in sheet and rods or tubes, for machining or stamping into parts; abrasion resistance, low; resists corrosion caused by oils and grease; flexibility, low, and high when treated with glycerine; ts, 6500-8500 psi; compressive, 20-35,000; nonflammable; available in red, gray, white and black olive; shatterproof; sp gr, 1.36-1.4; corrosion-resistant. For insulation, special gaskets, washers, special parts, dust-guards, pulleys, gears, etc.

- 2 - - - - - - - 10
PERBUNAN — Stanco Distributors Inc., New York 4. Synthetic rubber, butadiene-acrylonite polymer; (vulcanizable by the same process as used for natural rubber); furnished in sheets; for molding or extruding; abrasion resistance, medium; resists swelling by oil; heat-resistant to 300 deg F; flexibility, high (-65 deg F); dielectric constant, 15 to 60 cycles; tensile strength, 3500 psi, min; moisture absorption, low; specific gravity, .96; translucent; machinability, good; for gaskets, packings, mountings, etc.

1 - 3 - - - - - - 10
PERMANITE—Maurice A. Knight C., Akron 9, O. Resinous base, thermoplastic; furnished in sheet, rods or tubes, laminated form and in powder for molding, casting, machining, extruding and hand forming. Abrasion resistance, high; resists corrosion caused by acids, alkalies, and salts; heat resistant to 360 deg. F; flexibility, low; ts, 1000 psi; compressive, 50,000 psi; moisture absorption, very low; produced in black only; sp gr, 90-120 lb per cu ft; opaque; machinability, good. Recommended for parts subject to corrosion by acids and other chemicals.

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PHEMALOID — Haskelite Mfg Corp., Grand Rapids 2, Mich. Compound lumber; phenolic resin bonded; waterproof; resistant to fungus, bacterial decay, and diverse climatic conditions; bendable to desired forms. Used for truck, bus and train floors, boat hulls and decks, etc. Supplied in flat stock only, in sizes 48 x 96 in., 56 x 96 in., and 72 x 96 in. Available in 96-in. widths and as long as is expedient to ship on special order where scarfing is allowed.

1 - 3 - 5 - - - - -
PHENOL FIBRE—Penn Fibre & Specialty Co., Philadelphia. Phenolic base thermosetting material; furnished in sheets, laminated form, and in rods or tubes for machining and stamping into parts; abrasion resistance, high; resists corrosion caused by air, water, oils, light forms of acids; heat-resistant to 600 deg F; flexibility, low; dielectric strength, 500 volts per mil; ts, 8-12,000 psi; compressive, 20-35,000; moisture absorption, low; nonflammable; shatterproof; available in natural, brown and black; sp gr, 1.4; can be highly polished. For gears, bearings, washers, gaskets, special parts, insulation, pulleys, etc.

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PHENOLITE—National Vulcanized Fibre Co., Wilmington, Del. Laminated Bakelite; furnished with base of paper, cloth or asbestos in sheets, rods, tubes and fabricated shapes; also laminated with rubber sheet; high dielectric and mechanical strengths; low moisture absorption; heat-resistant; infusible; resistant to acids, solvents and oils; high resistance to wear and impact; machinable. Used in electrical, mechanical and chemical applications for silent gears, bearings, bushings, washers, valve disks, terminal strips, etc.

See advertisement, Page 266

1 - - - 5 6 - - - -
PINCO Porcelain—The Porcelain Insulator Corp., Lima, N. Y. Ceramic base material; furnished in rods or tubes and special shapes, for molding and extruding; abrasion resistance, high; resists corrosion caused by contamination in air, oil pyronol, or most acids; flexibility, low; dielectric strength, 250 kv.—⅜-in. thickness and 170 kv.—1-in. thickness; ts, 5000-8000 psi; compressive, 100,000; moisture absorption, 0 after 10,000 psi pressure for 24 hrs. Produced in color; sp gr, 2.4; opaque. For pumps (acid) pipe-insulating bases, valves (acid), etc.

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PLASKON — Plaskon Division, Libbey-Owens-Ford Glass Co., Toledo.

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Urea-formaldehyde, thermosetting material; furnished in powder form for molding into parts; abrasion resistance, high; resists corrosion caused by weak acids and alkalies; heat-resistant to 170 deg F; flexibility, low; dielectric strength, 300-400 volts per mil; ts, 8000-13,000 psi; compressive, 24-35,000; moisture absorption, medium; available in colors; sp gr, 1.48-1.5; translucent. Used for housings, trim, knobs, dials, etc.

1-Corrosion resistant
2-High heat resistant
3-Impact resistant
4-High tensile strength
5-High dielectric strength
6-Nonflammable
7-Takes high polish
8-Translucent
9-Available in colors
10-Low moisture absorption

- 2 - - 5 - - - - - 10
Melamine-formaldehyde, thermosetting material, in powder form for molding; abrasion-resistant; resists corrosion caused by weak acids and alkalies; heat-resistant to 210 deg F.; dielectric strength, 300-400 volts per mil; ts, 8000-13,000 psi; compressive, 25-35,000; available in colors; sp gr, 1.48-1.5; translucent.

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PLASTACELE—E. I. du Pont de Nemours & Co. Inc., Wilmington 98, Del. Cellulose-acetate base, thermoplastic; furnished in powder, sheets, rods and tubes, for machining and molding into parts; available in colors; transparent; resistant to shock; high polish; corrosion-resistant; flexible; dielectric strength, 700-1000 volts per mil; ts, 3000-8000 psi; heat resistance, 185-250 deg F. Used for machine guards, models, control panels, dials, knobs, steering wheels, safety glass screens, etc.

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PLASTIKFLEX—R. D. Werner Co. Inc., New York. Flexible tubing, thermoplastic; to be extruded. Used for conduits, insulation, hose, fuel lines, hospital equipment, sleeving, spacers, stirrup pumps, gaskets, gages, (square tubing for dehydration), etc.

- 2 - - - - - - - - 10
PLASTIPLY—Haskelite Mfg Corp., Grand Rapids 2, Mich. Plastic covered plywood; extremely stable under wide temperature and moisture variations when edges are sealed; high abrasion resistance; high in impact and tensile strength. Furnished in flat sheets and molded forms.

1 2 - - - 6 - - - - -
PLASTROX "B"—Ingersoll Plastics Co., New York. Fibrous, thermosetting material, furnished in laminated sheet and powder form; for molding; abrasion resistance, medium; resists corrosion caused by oil; heat-resistant to 1700 deg F; flexibility, low; moisture absorption, medium; shatterproof; opaque. For pans, gaskets, washers, heat insulators, fluorescent light reflectors, etc.

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PLAX POLYSTYRENE—Plax Corp., Hartford, Conn. Thermoplastic furnished in sheets, rods or tubes; for machining, stamping and extruding into parts; abrasion resistance, low; resists corrosion caused by acids, alkalies and alcohol; heat-resistant to 85 deg C; flexibility, low; dielectric strength, 500-2500 volts per mil; ts, 5000-7000 psi; moisture absorption, low; sp gr, 1.04. For electronic and electrical insulators.

1 - 3 - 5 - - - - - -
PLEXIGLAS—Rohm & Haas Co., Philadelphia 5. Acrylic base, thermoplastic; furnished in sheets and molding powders; corrosion and shock-resistant; transparent; flexible; sp gr, 1.18; ts, 5800-8000 psi; available in colors; high polish. Used for unbreakable inspection windows, dial covers, fuel gages, dials, lenses, safety shields, electrical devices, etc.

See advertisement, Pages 262, 263

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PLUSWOOD — Pluswood Inc., Oshkosh, Wis. Resin-impregnated plywood, heated by high frequency waves and simultaneously compressed under heavy pressure. Furnished in any desired thickness, in large or small sheets, in natural dark deep brown color. Has wood grain with high gloss finish; high density; lightweight; and is resistant to exposure. It can be sawed, drilled, turned, threaded, milled and tapped; nonflammable; highly resistant to decay, acids, alcoholic mixtures and other organic liquids. Sp gr, 1.3-1.4; ts (parallel laminated in fiber direction), 32-40.000 psi; compressive, 20-28,000; impact (Izod). 6-8 lb per in. of notch. For use as exhaust and blower fan blades, and in boat-building, aircraft and automotive industries.

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PLYCRAFT—Frank C. Snedaker & Co. Inc., 9th and Tioga Sts., Philadelphia 40, Resin-bonded plastic plywood with high tensile strength. Weatherproof; resistant to age, bacteria, fungi, oil, chemicals and gasoline; nonflammable lightweight. Use of varieties of wood and bonded construction make it possible to predetermine and control hardness. Will not warp or buckle when exposed to alternate heat and cold, or stress, and once made, shape cannot be altered. Corrosion-resistant. Adaptable to any shape. Sound-dampening and nonconducting, making it desirable for use in motor, pump and generator housings, and in avoiding the danger of static. Also used in the aircraft industry, marine field, radio and communications, transportation, office equipment, agricultural machinery, etc.

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PLYMETL—Haskelite Mfg. Corp., Grand Rapids 2, Mich. Resin-bonded plywood, sheet metal bonded to one or both faces; has stiffness, rigidity; lightweight; metal on both faces insuring freedom from warpage. Types available for different purposes are galvannealed steel, stainless steel, aluminum, copper, chrome zinc, chrome steel, porcelain, etc. Used for applications in the automotive and railroad fields.

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PLYMOLD—Haskelite Mfg. Corp., Grand Rapids 2, Mich. Resin-bonded plywood, molded in simple or compound curvatures.

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PLYOPHEN—Reichhold Chemicals Inc., Detroit. Phenolic aldehyde, thermosetting material; furnished in the form of liquid resins or varnishes; soluble in alcohol. For molding and casting; abrasion resistance, high; resists corrosion caused by nearly all chemicals except strong oxidizing acids and strong alkalies. Heat resistant to 275 deg F; flexibility, medium; dielectric strength, 300-900 depending on the requirement; ts, 10-36,000 psi; compressive, 35,000 psi; moisture absorption, low; available in natural or black; shatterproof. For use where good mechanical properties are needed along with good dielectric strength, and corrosion resistance. One type used for bonding of wood under heat and pressure for plywood. Others are laminating varnishes used with paper, canvas, fiber glass, etc., to produce phenolic laminates, properties of which depend on the type of paper, etc., used. Tensile strength of 26,000 psi can be obtained for paper laminates; while with fiber glass, tensile strengths of 80,000 have been produced.

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PLY-TECH — Technical Ply-Woods, Chicago 1. Wood and phenolic base (plywood); thermoplastic; furnished in sheet form for machining. Abrasion resistance, medium; resists corrosion caused by moisture and termites; flexibility, medium; tensile and compressive strength, depend on construction; while moisture absorption depends on treatment; nonshatterproof; machinability, good.

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POLAROID—The Polaroid Corp., Cambridge, Mass. Light-polarizing glass and film. Principal property is 99.5 per cent polarization of transmitted light, uniformly over large area. Used for camera filters, polarizing attachments for microscopes, polarimeters, and other scientific instruments. Also for polariscopes to determine strain, three-dimensional motion picture apparatus and glareless auto headlights, nonpolarizing colored filters, etc.

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POLYETHYLENE—Plastics Div., Carbide & Carbon Chemicals Corp., New York 17. A thermoplastic material which has greater resistance to softening by high temperatures than any other similar material previously produced. Its outstanding characteristic is its unusually good electrical properties. It has extremely low coefficient of moisture absorption and water vapor transmission; resists the effects of practically all chemicals; is inherently flexible; can be produced as molded or extruded goods, sheet materials, film, sheeting, or any of the other usual forms of plastic materials.

See advertisement, Page 311

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POLYFLEX—Plax Corp., Hartford, Conn. Thermoplastic furnished in laminated sheets; for molding and machining into parts; abrasion resistance, low; resists corrosion caused by acids, alkalies and alcohol; heat-resistant to 85 deg C; flexibility, medium; di-electric strength, 2500-4000 volts per mil; ts, 7000-10,000 psi; moisture absorption, low; shatterproof; sp gr, 1.04; transparent; machinability, good. For electronic parts, covers, etc.

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POLYTHENE—E. I. du Pont de Nemours & Co. Inc., Wilmington 98, Del. Thermoplastic, supplied in sheets and in powder for molding. Elastic, tough; flexible over wide temperature range; chemically inert; good electrical properties; specific gravity, .92. Available in opaque colors. Used for cable insulation, protective lens covers, gaskets, liners, etc.

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PREG-TECH—Technical Ply-Woods, Chicago 1. Impregnated wood; thermoplastic; furnished in sheet form for machining into parts. Abrasion resistance, low; resists corrosion caused by termites and moisture; heat-resistant to 350 deg F; flexibility, medium; tensile and compressive strengths depend on construction; moisture absorption depends on treatment; nonshatterproof; machinability, good.

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PREGWOOD—Formica Insulation Co., Cincinnati. Phenolic, impregnated, laminated, densified wood; thermosetting; for machining and pressing; abrasion resistance, high; heat-resistant to 175 deg F; flexibility low; dielectric strength, 200 volts per mil; ts, 30,000 psi; compressive, 20,000 psi; moisture absorption, low; inflammable; shatterproof; opaque; can be highly polished. For use as switch gear, instrument plates, fan and propeller blades, etc.

See advertisement, Page 161

1 - - - 5 - - - - 10
PRESTITE—Westinghouse Electric & Mfg. Co., Pittsburgh 30. Ceramic base material molded from granulated composition; raw clay-like when molded and then fired to a temperature of 1250 deg C, becoming a non-porous vitrified mass. Corrosion-resistant; soluble in hydrofluoric acid only; heat-ber substitutes, textile sizings, paper coat-dielectric value are 300 deg F; dielectric strength, approx. 300 volts per mil; ts, approx 2000 psi. Colors may be obtained by ceramic glazes. Substitutes and replaces phenolic plastics in various cases.

See advertisement, Page 151

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PVA—E. I. du Pont de Nemours & Co., Wilmington 98, Del. Thermoplastic, polyvinyl alcohol. Material is furnished in powder form for molding and casting and used as an emulsifying agent, also in the preparation of grease, oil and solvent-resistant rubber substitutes, textile sizings, paper coatings, and adhesives. Is highly flexible; low dielectric strength; heat resistance to 200 deg F; takes color; shatterproof; sp gr, 1.3 powder; translucent; resistant to organic solvents. Used for oil-resistant gaskets, tubes, rollers, etc., as well as protective coatings on metal parts.

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PYRALIN—E. I. du Pont de Nemours & Co. Inc., Wilmington 98, Del. Nitrocellulose base, thermoplastic; furnished in sheets, rods and tubes, for machining into parts; transparent; available in colors; shock and corrosion-resistant; high polish; flexible; dielectric strength, 300-750 volts per mil; ts, 5000-10,000 psi. Used for handles, gage glasses, instrument covers, models, safety glass screens, etc.

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PYREX—Corning Glass Works, Corning, N. Y. Glass products such as tubing, cylinders, sheets, molded parts, etc., covering a wide range of chemical, physical and optical properties such as heat resistance, low or high thermal conductivity, low or high coefficient of expansion, excellent corrosion resistance; no appreciable moisture absorption; nonflammability; ability to bond to metal. Over 250 glasses regularly melted. Specific properties of typical product, PYREX brand piping, as follows: Linear coefficient of expansion .0000018 in. per deg F between 66-660 deg F. Thermal con-

1-Corrosion resistant
2-High heat resistant
3-Impact resistant
4-High tensile strength
5-High dielectric strength
6-Nonflammable
7-Takes high polish
8-Translucent
9-Available in colors
10-Low moisture absorption

ductivity 8.1 Btu/sq ft/hr/in./deg F at 77 deg F. Ts, 6000-10,000 psi; dielectric strength, very high.

- 2 - - 5 6 - - - - -
PYROPLAX—Cutler-Hammer Inc., Milwaukee. Asbestos base; furnished in cold-molded pieces; heat-resistance, 800-1000 deg F; nonflammable: dielectric strength, 40 volts per mil; resistant to corrosion and abrasion. Used for machine parts where resistance to high temperature is needed.

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1 - - 4 - - - - - - 10
REANITE—The United States Stoneware Co., Akron, O. Resinous base, thermosetting material, furnished in liquid form, for bonding metals to metals or rubber and plastics to metals; abrasion resistance, medium; resists corrosion caused by acids and alkalies; heat-resistant to 300 deg F; flexibility, high; ts, 3000 psi; moisture absorption, low; shatterproof; available in black only; opaque.

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RESILON—The United States Stoneware Co., Akron, O. Resinous thermoplastic; furnished in sheets and lumps to be molded and cast into machine parts; corrosion-resistant; flexible; high dielectric strength. Used for lining parts to resist corrosive attack.

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RESIMENE 803A—Monsanto Chemical Co., Plastics Div., Springfield, Mass. Cellulose-filled melamine-formaldehyde type molding compound, specifically developed for molding electrical connector inserts. Combines excellent arc resistant characteristics of melamine compounds with ready moldability of phenolic general purpose materials. Formulated to meet Navy Spec. 17P4 (I.N.T.), Type CFG. Sp gr, 1.44-1.46; flexural strength, 9000 psi; compressive, 32,700 psi.

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RESINOX—Monsanto Chemical Co., Plastics Div., Springfield, Mass. Phenolic molding compounds, in standard and special formulas; thermosetting; heat-resistant; sp gr, 1.25-1.75; flexural strength, 8000-15,000 psi; ts, 4200-8000 psi; impact strength, 0.2-8.00 psi Izod test; water absorption, 0.01-0.6 (immersion 48 hours %). Used in electrical equipment, large housings, radio cabinets, etc. This tradename also refers to phenolic impregnating and treating resins.

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RESIN X—The Plastics Industries Technical Institute, Los Angeles. Liquid furfural resin, adhesive and casting compound, for casting and bonding. Abrasion resistance, medium; resists corrosion caused by acids and solvents; heat resistant to 250 deg F; flexibility, low; dielectric strength, 500 volts per mil; ts, 4000 psi; compressive, 12,000 psi; moisture absorption, low; produced in dark colors; sp gr, 1.27; opaque; machinability, good. For bonding of nonmetallic materials, etc.

- 2 - 4 - - - - - - -
RESISTAL—Chemical Research Corp., Tulsa 1, Okla. High-strength plastic, having half the weight of aluminum, good electrical properties. Unaffected by all petroleum solvents, brines and acids and alkalies. Furnished in sheets 1/64 to 2 in. in thickness, in sizes 46 x 46 in., and 30 x 72 in.

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RESISTOFELT—Western Felt Works, Chicago. A lamination of high-grade wool felt and Neoprene. Used on revolving shafts; the felt lubricates the shaft and prevents entrance of dust; the Neoprene prevents passage of oil.

See advertisement, Page 304

1 - 3 4 - - - - - - -
RESISTOFLEX—Resistoflex Corp., Belleville, N. J. Synthetic resin base, furnished in sheet and laminated form, and in rods or tubes; abrasion resistance, high; resists corrosion caused by oils, gasoline, and organic solvents; heat-resistant to 250 deg F; flexibility, high; dielectric strength, 10.7 volts per mil; ts, 5236 psi; moisture absorption, medium; available in color; transparent, translucent; shatterproof; sp gr, 1.259. For diaphragms, gaskets, oil hydraulic and lubricating hose assemblies.

See advertisement, Page 256

- - 3 4 - - - - - - -
RESNPREST—Plylock Corp., subsidiary of M & M Wood Working Co., Portland, Ore. Phenol-formaldehyde bonded plywood; thermosetting; strong by unit weight; panel ¼-in. thick and 12-in. sq; weighs approximately 12 oz and supports over 400 lb; panels to 9 in. thick can be furnished if desired, widths to 72 in. (sanded) or 96 in. (unsanded); lengths to 144 in. special scarfed panels to 36 ft. Thicknesses up to 9 in. made on high frequency thermal press for gusset plates, etc, Cross-ply construction of material makes it splitproof and nails and screws can be fastened to very edge with safety. Resists heat and cold; and has low moisture absorption. Used wherever rigidity and lightweight is needed. Guaranteed against ply separation.

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RESPROID—Respro Inc., Cranston, R. I. Thermoplastic, furnished in rods or tubes for extruding. For electrical insulation.

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REVOLITE—Atlas Powder Co., Zapon-Keratol Div., Stamford, Conn. Cloth base impregnated with Bakelite resin; in either laminated or single ply form; heat-resistant; high dielectric strength; corrosion-resistant; low moisture absorption; impact-resistant. Used for cable wrappings, diaphragms for pumps and valves, gaskets and flexible connections for machinery such as pulverizers, and coated asbestos laundry roll covers for flat work ironers.

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RS—Irvington Varnish & Insulator Co., Irvington, N. J. Radio spaghetti; braided cotton sleeving coated with a smooth, continuous, lacquer film; conforms to ASTM and VTA specifications for Grade B-2 flexible varnished tubing; highly resistant to aging; obtainable in five colors.

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RUB-EROK—The Richardson Co., Melrose Park, Ill. Special rubber furnished in sheet form; corrosion-resistant; high dielectric strength; low moisture absorption; low loss factor. Used for electrical insulation.

See advertisement, Page 254

1 - - - 5 - - - - 10
RUB-TEX—The Richardson Co., Melrose Park, Ill. Hard rubber molded into parts, particularly desirable for electrical, heat and cold insulation; for industrial uses.

See advertisement, Page 254

1 - 3 - 5 - - - - - -
RYERTEX—Joseph T. Ryerson & Son Inc., Chicago. A nonmetallic bearing material designed for use with water, grease or oil lubrication primarily; high shock resistance; takes high polish; suitable for bearing loads to 5000 psi; resistant to acids and mild alkalies.

See advertisement, Page 307

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SAFLEX—Monsanto Chemical Co., Plastics Div., Springfield, Mass. Polyvinyl acetal thermoplastic sheet material, used as an interlayer in laminated safety glass; extremely tough from temperatures below zero to over 120 degrees Fahr.

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SANDEE—Sandee Mfg. Co., 3945 N. Western Ave., Chicago. Thermoplastics available in rods or tubes for extruding.

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K-4; vinyl base; heat-resistant to 150 deg F; flexibility, high; ts, at 25 deg C, 1500 psi; moisture absorption, low; available in color; sp gr, 1.22. For electrical insulation and for replacing rubber tubing and gaskets.

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T-2; cellulose acetate butyrate; in rods or tubes and custom shapes and sections; heat-resistant to 140 deg F; flexibility, low; dielectric strength, 250-400 volts per mil; ts 2300-6700; moisture absorption, low; available in color; shatterproof; sp gr, 1.15-1.24. For manometer tubes, refrigerator moldings, truck body molding, etc.

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SARAN—The Dow Chemical Co., Midland, Mich., and licensees. Crystalline, thermoplastic, aliphatic chloride with polymeric base; furnished in special extruded and molded forms; material is corrosion-resistant; very tough and flexible; ts, to 50,000 psi (extruded); low moisture absorption; abrasion-resistant; takes high polish; high dielectric strength; shatterproof; nonflammable; available in color; transparent to opaque. Used for moldings, gaskets, packings, tubing, belting, etc. Licensees: Acadia Synthetic Products Div., Western Felt Works, Chicago; Allied Plastics Co., Los Angeles; American Hard Rubber Co., New York; Elmer E. Mills Co., Chicago; Extruded Plastics Inc., Norwalk, Conn.; Firestone Industrial Prods., Akron, O.; Hodgman Rubber Co., Framingham, Mass.; Irvington Varnish & Insulator Co., Irvington, N. J.; National Plastic Products Co., Baltimore; Parker Appliance Co., Cleveland; Pierce Plastics Inc., Bay City, Mich.; J. L. Skuttle Co., Detroit; St. Louis Plastic Molding, St. Louis; Standard Products Co., Detroit; Yardley Plastics Co., Columbus, O.

See advertisement, Page 289

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SILENTBLOC—The General Tire & Rubber Co., Mechanical Goods Div., Wabash, Ind. Metal combined with natural or synthetic rubber for mountings, bearings and couplings. Used also for motor and machine mounts to control vibration and cushion shock loads; lubricationless oscillating or torque joint; and bushing to correct misalignment in bearings, hinges and shaft supports. Applications include industrial and household equipment, automotive, aircraft and marine fields; motors; electrical equipment; railroad equipment; farm machinery; etc.

See advertisement, Page 252

- 2 - - - - - - - - -
SIRVENE—Chicago Rawhide Mfg. Co., Chicago. Synthetic rubber compounds molded into parts; resistant to oils and heat, oxidation and weather. Used for sealing oils and greases, packings, gaskets, covers and special parts.

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SIRVIS—Chicago Rawhide Mfg. Co., Chicago. Special tanned abrasive and heat-resisting leather. Used for all types of packings, gaskets and mechanical leather parts.

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SPAULDING ARMITE—Spaulding Fibre Co. Inc., Tonawanda, N. Y. Hard vulcanized fibrous material (fish paper); sheets and rolls for stamping or forming into parts; flexible; dielectric strength, 200-550 volts per mil; abrasion and corrosion-resistant; ts, 9000-15,000 psi.

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SPAULDING FIBRE—Spaulding Fibre Co., Inc., Tonawanda, N. Y. Hard vulcanized fibrous materials; sheets, rods and tubes, for machining, stamping or forming into parts; dielectric strength, 150-400 volts per mil; ts, 9000-15,000 psi; available in colors; resistant to shock. Used for mechanical and electrical applications where toughness, lightweight and machining and forming properties are essential.

1 - - - 5 - - - - 10
SPAULDITE—Spaulding Fibre Co. Inc., Tonawanda, N. Y. Phenolic base, thermosetting; furnished in laminated sheets, rods and tubes for machining or stamping into parts; dielectric strength, 700 volts per mil; low

1-Corrosion resistant
2-High heat resistant
3-Impact resistant
4-High tensile strength
5-High dielectric strength
6-Nonflammable
7-Takes high polish
8-Translucent
9-Available in colors
10-Low moisture absorption

moisture absorption; high polish; corrosion and heat-resistant (220 deg F); resistant to shock. Used for electrical insulation and where resistance to moisture and chemicals, appearance and permanence are essential.

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SPAULDO—Spaulding Fibre Co. Inc., Tonawanda, N. Y. Fibrous material; furnished in sheets and rolls, for machining or stamping into parts; flexible; dielectric strength, 300 volts per mil; heat resistance, 220 deg F; high polish; corrosion-resistant; ts, 5000-16,000 psi; resistant to shock. Used for applications where flexibility and toughness in both grain directions are essential.

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STEATITE—General Ceramics & Steatite Corp., Keasbey, N. J. Ceramic material furnished in finished parts, or for molding, casting, machining, extruding and pressing; abrasion resistance, high; resists corrosion caused by alkalies and acids; heat-resistant to 1800 deg F; dielectric strength, 300 volts per mil; ts, 9500 psi; compressive, 81,000; moisture absorption, none; produced in white; impact resistance, 2.27 psi; sp gr, 2.7; opaque. For light bearings, radio frequency insulating parts, etc.

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STUPAKOFF No. 621—Stupakoff Ceramic & Mfg. Co., Latrobe, Pa. Steatite ceramic furnished in finished form or for molding, casting, machining, stamping, extruding. Abrasion resistance, high; resists corrosion caused by acid and alkalies, except hydrofluoric acid; dielectric strength, 200 volts per mil, inst.; ts, 9000 psi; compressive, 75,000; moisture absorption, low; available with colored glaze; sp gr, 2.6; opaque. For electrical insulating parts.

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STYRALOY 22, 22-A—Dow Chemical Co., Midland, Mich. Synthetic elastometer furnished as molding powder. Excellent low temperature flexibility to -75 deg C; high dielectric strength; low power factor, high insulation resistance. Ts, 1000 psi; elongation at break 250 per cent; good abrasion resistance. Low moisture absorption. Dark blue, translucent. Used for wire coating, electrical insulation; can be extruded, injection or compression molded.

See advertisement, Page 289

1 - - - - - - - - 9 10
STYRON NA, LA, GA, and CA—Dow Chemical Co., Midland, Mich. Thermoplastic; furnished in granules for molding; high clarity; corrosion-resistant; dielectric strength, 5000 volts per mil at 1 mil, 500 volts per mil at 125 mil; ts, ult to 10,000 psi; low moisture absorption; low flammability; available in color; transparent. Used for insulators, decorative articles, structural parts, general injection molding, etc.

See advertisement, Page 289

1 - - - 5 - - - - 10
SURCO AMERICAN—Surprenant Electrical Insulation Co., Ben, Mass. Thermosetting; furnished in sheets, rods or tubes; for molding, stamping and extruding. Abrasion resistance as required; resists corrosion caused by acids and other corrosion elements; heat resistant to the degree required; flexibility as required; dielectric strength, 1500 volts per mil avg; ts, 200-4500 psi; moisture absorption, low; available in 26 colors; shatterproof; sp gr, .90-1.45; opaque; machinability, good. For control cables, etc. in machine tools.

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SWEET HOME BRAND—Am-mex Sales Co. Inc., Buffalo. Phenolic resin-bonded, thermosetting fir plywood, machined into parts; moisture and water-resistant. Used for aircraft cabinets, instrument panels, bases, bodies, boats, etc.

1 - 3 - - - - - - 10
SYNFLEX—Industrial Synthetics Corp., Irvington, N. J. Rubber-like synthetics; polyvinyl chloride and polyvinyl copolymers; thermoplastic; in rods, tubes, shapes and tapes for extruding. Abrasion resistance, high; resists corrosion caused by weak and strong inorganic acids, sulphuric acids and alkalies; heat resistant to 230 deg F; flexibility, high; dielectric strength to 3600 volts per mil, ts, to 3600 psi; moisture absorption, low; shatterproof; sp gr, 1.18-1.48; transparent, translucent and opaque. Four outstanding compounds as well as special compounds for specific applications are available, such as window channel, mechanical rubber goods, electrical insulation, communications, etc.

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SYNTHANE—Synthane Corp., Oaks, Pa. Phenolic, thermosetting materials, corrosion-resisting; furnished in sheets, rods and tubes, fabricated parts, and in parts made by molding the impregnated base materials. Available in following grades:

X; Kraft paper base, hard resin, laminated material; for mechanical applications where electrical requirements are of secondary importance; ts, 12,500 psi.

XP; Kraft paper base, plasticized resin, laminated material, primarily intended for punching; more flexible and not quite as strong as Grade X; moisture resistance and electrical properties intermediate between Grades X and XX.

XX; cotton rag paper base laminated material; hard, greater percentage of resin than Grade X. Suitable for usual electrical applications; good machinability.

XXP; cotton rag paper base laminated material; similar to Grade XX in electrical and moisture-resisting properties, but more suitable for hot punching. Intermediate between Grades XP and XX in punching and cold flow characteristics.

XXX; cotton rag paper base laminated material; suitable for radio frequency work, for high humidity applications; minimum cold flow characteristics.

XXXP; cotton rag paper base laminated material; similar to Grade XXX but with lower dielectric losses and more suitable for hot punching; greater cold flow than Grade XXX, and intermediate between Grade XXP and XXX in punching characteristics.

C; heavy weave fabric; base laminated material made throughout from cotton fabric weighing over 4 oz per sq yd, and having a count of not more than 72 threads per in. in the filler direction, nor more than 140 threads per in total in both warp and filler direction. Strong, tough material suitable for gears and other applications requiring high impact strength. Available in subgrades, depending upon sizes of gears and types of mechanical service. Should not be used for electrical applications.

CE; heavy weave fabric base laminated material, same as Grade C. For electrical applications requiring greater toughness than Grade XX, or mechanical applications requiring greater resistance to moisture than Grade C.

L; fine weave fabric base laminated material, of cotton; suitable for small gears and other fine machining applications, particularly in thickness under ½-in. Not quite as tough as Grade C; should not be used for electrical applications except for low voltage.

LE; fine weave fabric base laminated material, same as Grade L; for electrical applications requiring greater toughness than Grade XX; better machining properties and finer appearance than Grade CE. Also available in thinner sizes. Exceptionally good in moisture resistance.

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SYROCO—Syracuse Ornamental Co., Syracuse, N. Y. Moulded wood; thermosetting and thermoplastic; furnished as molded parts; abrasion resistance, low; flexibility, low; opaque; for nameplates or decorative parts, also for radio type control knobs.

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TAYLOR FIBRE—Taylor Fibre Co., Norristown, Pa. Phenolic base, thermosetting; furnished in laminated sheet, rods or tubes for machining into parts; high polish; flexural strength, 12,000-16,000 psi; dielectric strength, 500 volts per mil; ts, 5000-9000 psi; heat resistance, 300 deg F; low moisture absorption; available in colors; impact-resistant; Bhn, 35-45. Used for gears, and insulating and binding material against moderate temperatures.

See advertisement, Page 171

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TEGIT—Garfield Mfg. Co., Garfield, N. J. Tan colored, cold-molded plastic; corrosion-resistant; high dielectric strength; moisture absorption less than 1 per cent; heat resistance, 300 deg F; impact-resistant; resists hot oil, boiling water and ordinary chemicals; will not shrink, crack, warp or deteriorate with age. Used for heavy-duty wiring devices and small insulated parts.

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TEGO—Resinous Products & Chemical Co., Philadelphia 5. A synthetic resin (adhesive) phenolic resin film, dry sheet. Has low moisture absorption, high density. Used in manufacture of waterproof plywood for aircraft and marine use.

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TENITE—Tennessee Eastman Corp., Kingsport, Tenn.

I; cellulose-acetate base, thermoplastic; furnished in granular and molding sheet form; available in clear transparent and colors, plain, variegated, translucent and opaque; high impact strength; high polish. Used for compression and injection molding decorative and industrial products, also extruded in form of strips, rods and tubes.

II; cellulose-acetate butyrate base, thermoplastic; furnished in granular and molding sheet form; has greater dimensional stability than cellulose acetate plastic because of lower moisture absorption; contains less plasticizer than cellulose acetate plastic and the plasticizer used has greater retentivity; available in clear transparent and colors; plain, variegated, translucent and opaque; high impact strength; high polish. Used for compression and injection molding of decorative and industrial products, also extruded in form of strips, rods and tubes.

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TENSILASTIC—American Wringer Co. Inc., Woonsocket, R. I. Hard and soft rubber and rubber synthetics for rolls and linings and covering of tank parts, etc. Available in any size from ½-in. long and ½-in. in diam to 300 in. long and 44 in. in diam; any density from dead hard to very soft; compounded to meet mechanical and chemical requirements; heat-resistant to 180 deg F; flexibility, high; moisture absorption, low.

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TEXRUB—M. B. Price Associates, New York. Rubber-like, vinyl base, thermosetting and thermoplastic materials, furnished in laminated sheets, rods or tubes; for molding, casting, machining, stamping and extruding into parts; abrasion resistance, high; resists corrosion caused by water, gas, oils, alkalies, uric acid and 30 per cent sulphuric acid and ozone; softens at 240 deg F; melts at 330; flexibility, good; ts, 2500 psi. Available in black, white, gray, red, brown and green; translucent and opaque; shatterproof; sp gr, 1.26. Used for chemical tubing and piping, etc.

1 2 3 4 - - - - - -
TEXTOLITE—General Electric Co., Plastics Division, Pittsfield, Mass. Phenolic, urea cellulose bases, thermosetting and thermoplastic materials; compression, injection and transfer molded, laminated, molded laminated, sheets, rods, tubes, bearings, fabricated parts; abrasion and corrosion resistant; ts, 3500-20,000 psi; dielectric strength 60-1000 volts per mil; heat resistant 140-150 deg F; resistant to shock; flexible in some grades; available in color; takes high polish; translucent in some grades; sp gr, 1.07-2.03. Used for electrical or thermal insulation, structural parts, gears, cams, bearings, housings, knobs, etc.

1 2 - 4 - - - - - -
Cold Molded—Two types; nonrefractory material containing asphalt as a binder and asbestos as a filler and refractory containing cement and drying oils as a binder with an asbestos filler; cold molded at room temperatures and heat treated for strength and toughness; corrosion-resistant; heat and arc-resistant. Not recommended for parts requiring high electric strength or thin sections.

See advertisement, Page 293

1-Corrosion resistant | 2-High heat resistant | 3-Impact resistant | 4-High tensile strength | 5-High dielectric strength | 6-Nonflammable | 7-Takes high polish | 8-Translucent | 9-Available in colors | 10-Low moisture absorption

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THERMOPANE—Libbey-Owens-Ford Glass Co., Toledo, O. Metal-to-glass edge-sealed with dehydrated dead-air space; furnished in flat units; abrasion resistance, high; resists corrosion; heat-resistant to 150 deg F; flexibility, low; dielectric strength, .204 kilovolts per mil; modulus of rupture, 6500 psi; nonflammable; moisture absorption, low; sp gr, 2.52; coefficient U for double-glass Thermopane with ¼-in. or ½-in. airspace approx .55; transparent and translucent. For insulated observation windows.

See advertisement, Page 272

- 2 - - 5 6 - - - - -
THERMOPLAX—Cutler-Hammer, Inc., Milwaukee. Bituminous base compounded with filler such as asbestos; cold-molded into parts; heat resistance, 400-600 deg F; nonflammable; dielectric strength, 80-100 volts per mil; resistant to corrosion; takes high polish; ts, 2000-4000 psi; moisture absorption, 2 per cent. Used for electrical and heat insulation.

1 - 3 - - - - - - 9 -
THIOKOL—Thiokol Corp., Trenton, N. J. Synthetic rubber, available in three types: Crude, corresponding to crude rubber, water dispersions for coatings, and molding powders; processed in manner similar to rubber; oil corrosion and solvent-resistant. Used for hoses carrying oil or gasoline, gaskets, packing, pipeline rings, diaphragms, newspaper printing blankets, etc.

- - 3 - - - - - - - -
THORFLEX—Harris Products Co., Cleveland. Rubber and metal flexible bearings, flexible couplings and compressed shackles.

1 - - - - - - - - - -
TRANSFLEX — Irvington Varnish & Insulator Co., Irvington, N. J. Transparent, flexible, extruded plastic tubing which when used as conduit permits quick identification of coded enclosed leads and location of wire breaks; unusual elongation facilitates stretching over lugs, splices and other projections; does not become brittle at temperatures as low as —58 deg F. Dielectric strength, 1200 volts per mil dry, 1000 volts per mil wet—for tubing wall thickness approximately .020-in.

1 2 3 - - - - - - - -
TUF-FLEX—Libbey-Owens-Ford Glass Co., Toledo, O. Polished plate glass heat tempered, furnished in sheet and laminated form; resists corrosion caused by moisture and all common acids except hydrofluoric acid; heat-resistant to 550 deg F; flexibility, medium; dielectric strength, .204 kilovolts per mil; modulus of rupture, 30,000 psi; not shatterproof but 4-5 times stronger than plate glass; produced in clear and colors; sp gr 2.52. For machine guards, observation and inspection windows, sight glasses, gage glasses, etc.

See advertisement, Page 272

- - - - 5 6 - - 9 10
TULOX—Extruded Plastics Inc., Norwalk, Conn.

- - - - - - - - 9 10
TT; thermoplastic, furnished in rods or tubes for extruding; in sizes from .100-2 in. OD; medium abrasion resistance; heat-resistant to 160 deg F; flexibility, low; ts, 4-5000 psi; low moisture absorption; available in color; sp gr, 1.2; shatterproof; transparent; translucent; opaque; machinability, good. For use as gage glasses and small screw machine parts, separators, etc.

- - - - 5 6 - - - 10
V series; thermoplastic, furnished in rods or tubes for extruding; in sizes from .100-2½ in. OD; high abrasion resistance; resists corrosion caused by most chemicals; heat-resistant to 150 deg F; flexible; dielectric strength (.025-in. thick) 1100 volts per mil; ts, 1500 psi; low moisture absorption; available in color, shatterproof; for insulation.

EC; thermoplastic, rigid; furnished in tubes, medium abrasion resistance, high impact strength at low temperature; transparent colors, translucent, opaque, no crystal clear. Tubular parts for use where high impact strength is required over a range of —40 deg F to 150 deg F.

1 - - - 5 - - - 9 10
TYGON—The United States Stoneware Co., Akron, O. Synthetic resin, thermoplastic; furnished in flexible or rigid sheets, tubing, rods, or in liquid form; may be molded cast or extruded. Abrasion, impact and corrosion-resistant; unaffected by oil, gasoline, water; nonaging; high dielectric and tensile strength. May be transparent, translucent or opaque; available in colors. Nontoxic.

U

1 - - - - - - - - - 10
UFORMITE—Resinous Products & Chemical Co., Philadelphia 5. A synthetic resin (adhesive) urea-formaldehyde; furnished in powder form; has low moisture absorption, high density. Used in manufacture of waterproof plywood for aircraft and marine use.

1 - 3 - 5 - - - - -
UNISORB—Felters Co., Boston. Specially controlled felt for vibration absorption types and thicknesses available for most frequencies and loadings encountered in industrial field. Also type available for sound absorption. Petroleum-resistant. A special brand cement is also available for use with this material in order to eliminate the need of any other form of hold downs such as expansion bolts or lag screws. Holding strength in excess of 40 psi when used between the felt and steel, concrete or wood.

See advertisement, Page 284

1 - 3 - - - - - - -
U. S. RUBBER—U. S. Rubber Co., New York. A synthetic rubber for hose, belts, packings, molded goods, tank linings, and other uses.

See advertisement, Page 288

1 2 - - 5 - - - - -
"U. S." STANDARD—The United States Stoneware Co., Akron, O. Acid-proof chemical stoneware available in a wide range of shapes and sizes; resists all corrosives except hydrofluoric acid and hot caustics; for fabrication into tanks, etc., and for lining exhausters and acid-pumps. Hard, durable, available in heat-shock resistant bodies.

1 - - - 5 - - - - 10
UNIVERSAL PORCELAIN—The Universal Clay Products Co., Sandusky, O. Ceramic base material for molding into parts; resists corrosion caused by acids, climatic exposure and fumes, with the exception of hydrofluoric acid; heat-resistant to 500 deg F; moisture absorption, low; available in color; sp gr, 2.3-2.5; opaque. For use in electric insulation.

V

1 - 3 4 - 6 - - - 10
VALITE—Valentine Sugars, Lockport, La.

1 - 3 - - - - - - 10
No. 1609 AB; molding compound; phenolic; thermosetting; furnished in powder; abrasion resistance, medium; resists corrosion caused by oils, mild acids and alkalies; heat-resistant above 275; flexibility, low; dielectric strength, 200 volts per mil; ts, 7300 psi; compressive, 24700 psi; moisture absorption, low; available in black and dark colors; good shock resistance; sp gr, 1.41; opaque; machinability, good; hardness, 100-110 Rockwell M. For housings, operating handles, switch covers, etc.

- - 3 4 - 6 - - - -
No. 8123, laminating resin; thermosetting; for impregnating duck, paper, etc. For housings, silent gears, mountings, electrical parts, switches, etc.

VIBRACORK—Armstrong Cork Co., Lancaster, Pa. Resilient board of cork granules; compressed and baked under pressure; long life and high resistance to deterioration. Material is made in three densities for vibration damping applications.

See advertisement, Page 258

1 - - - - - - - - - -
VICTOLENE—Victor Mfg. & Gasket Co., Chicago. Synthetic rubber compound, thermosetting material, furnished in sheets and stampings, for molding into parts; resists corrosion caused by oil, gasoline, kerosine, salt water and antifreezes; heat-resistant to 250 deg F; flexibility, high; ts, 350 psi; compressive .038-in. for stock—.190 in. under 2960 psi; moisture absorption, medium; inflammable; available in brown; shatterproof; sp gr, 1.12; opaque. For gasketing material, when compressed in position by light metal or plastic stampings, used for sealing fluids.

- 2 - 4 - 6 - - - -
VICTOPAC—Victor Mfg. & Gasket Co., Chicago. Compressed sheet packing with asbestos base for stamping or cutting by hand into parts; high corrosion resistance; flexibility; ts, 2500 psi; heat-resistant; low moisture absorption; nonflammable; impact-resistant; high compressive strength. Used for gasketing and packing.

1 2 - - - - - - - 10
VICTOPRENE—Victor Mfg. & Gasket Co., Chicago. Synthetic elastic, thermosetting; furnished in sheet or molded form. Sheets may be stamped and blanked into parts; corrosion and heat-resistant; ts, 1500 psi; low moisture absorption; shatterproof. Used as a gasketing material.

1 2 - - - 6 - - - 10
VICTOR—Victor Mfg. & Gasket Co., Chicago.

1 2 - - - 6 - - - -
Asbestos sheet, asbestos fiber base; furnished in sheets for stamping or cutting into parts; corrosion-resistant; flexible; ts, 300 psi; heat resistance, 700 deg F; nonflammable; sp gr .9; high compressive strength, insoluble; some resilience. Used for packing, thermal insulation, and vibration absorption

1 2 - - - - - - - 10
Cork sheet; vegetable bark in sheet form for stamping and cutting into parts; corrosion-resistant; flexible; heat resistance, 180 deg F; low moisture absorption; sp gr, .27; fair compressive strength; resilient. Used for seals, vibration absorption.

- 2 - 4 - - - - - -
VICTORITE—Victor Mfg. & Gasket Co., Chicago. Vegetable fiber base, sheet packing; furnished for stamping or cutting by hand into machine parts; flexible; ts, 3000 psi; heat resistance, 200 deg F; nonflammable; impact-resistant; sp gr, .675; compressive strength, 2000 psi; resilient. Used for gasketing and packing.

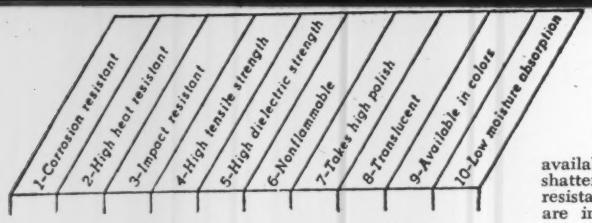
1 - - - - 6 - - - 10
VINYLITE—Carbide & Carbon Chemicals Corp., New York 17.

Vinyl resin thermoplastic material available as rigid sheets, flexible sheeting, flexible film, rigid and elastomeric molding and extrusion compounds, surface coatings, cloth coatings, textile treatments, adhesives and monofilaments. Can be formed, drawn, laminated, and bonded under moderate heat and pressure. In their basic form, they are odorless, tasteless, nontoxic, and range from nonflammable to slow burning. Some of them have exceptional resistance to moisture and most chemicals. They are strong and tough even at lower-than-freezing temperatures. They do not warp and have unusual dimensional stability.

Vinyl chloride-acetate resins both elastomeric and rigid products in many forms; vinyl acetate resins, adhesives and textile treatments; vynil butyral resins, safety glass and cloth coatings; vinyl chloride resins, molding and extrusion compounds.

See advertisement, Page 311

1 - - - - 5 - - - - 10
VISTANEX—Stanco Distributors Inc., New York 4. Non vulcanizing plastics, isobutylene polymer base material, furnished in sheets; for molding or extruding; abrasion resistance, medium; resists corrosion caused by acids, alkalies and oxidation; flexibility, low; dielectric constant, 2.2 at 1000 cycles; tensile strength, 1500 lb per sq in.; moisture ab-



sorption, low; specific gravity, .91; translucent; machinability, poor; for electrical insulation, etc.

- - 3 - - - - - - 10
VITALIC—Continental Rubber Works, Erie, Pa. Molded, extruded and lathe-cut mechanical rubber products including hose, fan belts, and all types of industrial rubber goods.

1 2 - - - 6 - - - -
VITRIC-10—The United States Stoneware Co., Akron, O. Ceramic-base, nonplastic; furnished in powder form for casting into parts, or as complete parts; corrosion and heat-resistant (1000 deg F); nonflammable. Available in colors; used for cementing and sealing.

- 2 - 4 5 - - - - -
VULCABESTON—Colt's Patent Fire Arms Mfg. Co., Hartford, Conn. Crude and synthetic rubber and asbestos base, thermosetting. Furnished in sheet and laminated forms or rods and tubes for machining into parts or supplied as complete parts; heat resistance, 750 deg F; ts, 7000 psi; dielectric strength, 40 volts per mil; corrosion-resistant; low moisture absorption. Uses include insulation, brake linings, packing, gaskets, etc.

- - - 4 5 - - - - 10
VULCOID — Continental-Diamond Fibre Co., Newark, Del. Resinous base, thermoplastic; furnished in sheets and laminated forms, or rods and tubes for machining, stamping or forming into parts; low moisture absorption; dielectric strength, 400 volts per mil; ts, 11,000 psi; resistant to abrasion; flexible in some forms; heat resistant to 275 deg F; available in red, gray, black; nonflammable; shatterproof. Used for insulation where arc resistance and moderate moisture resistance are important.

- - 3 - - - - - 9 -
VULPRENE — American Resinous Chemicals Corp., Peabody, Mass. Synthetic rubber-soya, thermosetting material; furnished in sheets and powder; for molding and extruding. Abrasion resistance, low; resists corrosion caused by acids; heat-resistant to 500 deg F; flexibility, low; ts, 500-700 psi; produced in color; shatterproof; sp gr, 1.2; opaque; ages better than rubber. Used for insulation.

1 - - - 5 - - - - -
VYCOR—Corning Glass Works, Corning, N. Y. Glass is approximately 96 per cent pure silica; in sheets, rods or tubes, cast, molded or machined. Has high heat resistance, very low coefficient of thermal expansion, excellent corrosion resistance (except HF) and dielectric properties. Can be used at much higher temperatures than other glasses; also adaptable to high-frequency insulation. Linear coefficient of expansion .0000005 per deg F; softening point 2730 deg F; maximum operating temperature, 1450-1750 deg F; ts, 4000-10,000 psi; compressive, 50-200,000 psi; sp gr, 2.2; hardness, 5.5-6.5 (Moh's). Available in opaque, transparent and ultraviolet transmitting types. For rotating seal rings, thermocouple sleeves and coil forms.

W

- - 3 4 5 - - - - -
WELDWOOD—United States Plywood Corp., New York. Phenol-formaldehyde and urea-formaldehyde resin-bonded plywood; thermosetting; flexibility varies with thickness; splitproof; shatterproof; high tensile and dielectric strength. Obtainable in waterproof and water-resistant grades in all woods. Also available in molded shapes, tubular and curved.

- 2 - - - 6 - - - -
WEST FELT—Western Felt Works, Chicago. Felt material; furnished in cut shapes according to user's specifications for vibration dampening, deadening sound, insulating against heat and cold and filtering liquids, air and gases; also furnished as oil or dust seals for bearings.

See advertisement, Page 304

- - 3 4 5 - - - - -
WILMINGTON FIBRE—Wilmington Fibre Specialty Co., Wilmington 99, Del. Cotton rag and paper, chemically treated, nonplastic material; furnished in sheet form or rods and tubes for machining or stamping into parts; dielectric strength, 200-400 volts per mil; ts, 12-15,000 psi; resistant to shock and corrosion; high polish; available in colors. Used for electrical and mechanical insulation.

- - - - - - 7 - - 10
WOODEX—Neveroil Bearing Co., Wakefield, Mass. Impregnated rock maple furnished in parts which can be machined; heat resistant to 100 deg F; inflammable; can be highly polished. For bearing surfaces in textile, road building, agricultural, tobacco and many other types machinery.

- - - - - 6 - - - -
WOODITE—Syracuse Ornamental Co., Syracuse, N. Y. Molded wood; thermosetting and thermoplastic; furnished as molded parts; abrasion resistance, low; flexibility, low; opaque; for nameplates or decorative parts, also for radio type control knobs.

Index of Plastics and Nonmetallics by Type

SUPPLEMENTING the alphabetical listing by tradenames which will be found commencing on Page 208, this index has been compiled to aid the designer in the selection of nonmetallic materials where either the tradenames are not known or it is desired to compare the properties of similar materials. Such properties are given in the alphabetical listing mentioned above.

Types of materials are indexed alphabetically below, each type carrying its groupings of tradenames. In the case of plastics, two major headings, "thermosetting" and "thermoplastic", are further qualified by breakdown into chemical-base groups.

ADHESIVES

Amberlite
Tego
Uformite

ASBESTOS

Victor (sheets)

BONDING RESINS

Cardolite
Catabond
Resin X

CERAMICS

Ceraware
Firecrete
Hemit
Lenoxite
Mycalex
Pinco
Steatite
Stupakoff
U. S. Standard
Universal Porcelain
Vitric-10

COMPOSITIONS

Aertite
Armstrong's
Carbocell
Celite
Centraline
Cottonleather
Eel-Slip
Farlite
Featherweight
Fibron
FV
Graphicell
Graphitar
Hy-Temp
Illinois
Karbate
National Carbon
National Switch
Resistal
Revolite
RS
Ryertex
Styraloy
Transflex
Victopac
Victorite

CORKS

Armstrong's
Vibracork
Victor

FELTS

American
Booth
Dufelt
Felters
Fidelity
Gaskofelt
"K" Felt
Resistofelt
Unisorb
West Felt

FIBERS

Brandywine
Diamond
Fyberoid
National
Peerless
Penn
Phenol
Spaulding Armite
Spaulding
Spauldo
Wilmington

GLASSES

Aerolite
Blue Ridge
Duolite
Duplate
Fiberglas
Flexseal
Herculite
KGI
LOF (heat-absorbing plate)
LOF (polished plate)
Multiplate
Polaroid
Pyrex
Thermopane
Tuf-Flex
Vycor

LEATHERS

Sirvis

MICA

Micabond

PLASTICS

(Thermosetting)

Aniline formaldehyde
Formica

Ceramic
Prestite

Fiber
Kys-ite K-100

Lignin
Lignolite

Melamine formaldehyde
Melmac
Plaskon
Resimene

Monomers
Allymer
Dupont Polyvinyl

Phenolic
Bakelite
Catalin
Celoron
Co-ro-lite
Dilecto
Durez
Durite
Farlite
Formica
Indur
Indur Varnish
Insurok
Kys-ite
Lamicoid
Lamitex
Makalot
Micarta
Neillite
Ohmoid
Panelyte
Phenolite
Resinox
Spauldite
Synthane
Taylor
Textolite
Valitl
Vulcoid

Urea
Bakelite
Beetle
Farlite
Insurok
Lamicoid
Makalot
Plaskon
Textolite

Vinyl
Clearseal
Texrub

Cold Molded
Ebrok
Garit
Gummon
Pyroplax
Tegit
Textolite
Thermoplax

OTHER TYPES

Duralon
Irv-o-slot
Irv-o-volt
K.E.M.
Laminac
Plastrox "B"
Reanite
Surco American

PLASTICS

(Thermoplastic)

Acrylic
Plexiglas

Acrylic butyrate
Gemlite

Aniline formaldehyde
Cibanite
Dilectene

Cellulose acetate
Bakelite
Cel-o-glass
Chemaco
Durashield
Fibestos
Gemloid
Inceloid
Lumarith
Nixonite
Plastacele
Sandee
Tenite
Textolite
Tulox

Cellulose nitrate
Celluloid
Nitron
Nixonoid
Pyralin
Textolite

Ethyl cellulose
Chemaco
Ethocel

Methyl methacrylate
Lucite

Polyamide
Nylon

Polybutene
Vistanex

Polymeric
Kem-pol
Resilon
Saran

Polystyrene
Bakelite
Chemaco
Loalin
Plax

Polyvinyl acetal
Saflex

Polyvinyl alcohol
Compar
PVA
Resistoflex

Styrene
Lustron
Styron

Vinyl
Chemaco
Clearseal
Gemflex
Sandee
Texrub
Tulox
Tygon
Vinylite

OTHER TYPES

Ameroid
Cerex
Geon
Irv-o-lite
Ivi-flex
Paraplex
Permanite
Plastikflex
Polyethylene
Polyflex
Polythene
Resproid
Synflex

RUBBERS

Acadia
Ace
Ameripol
Butaprene
Butyl
Cell-Tite
Chemigum
Duflex
General
GR-1
Hycar
Hyflex
Koroseal
Lord
Luzerne
Neoprene
Orco
Perbunan
Rub-erok
Rub-tex
Silentbloc
Sirvene
Tensilastic
Thiokol
Torflex
U. S. Rubber
Victolene
Victoprene
Vitalic
Vulcabeston
Vulprene

VARNISHES

Harvel
Irvington

WOODS

American
Armorply
Armstrong's
Dense-Trech
Densewood
Die-Tech
Farlite
Fybr-Tech
Haskelite
Jamestown
Lignum-Vitae
Nigrum
Phemaloid
Plastiply
Pluswood
Plycraft
Plymetl
Plymold
Ply-Tech
Preg-Tech
Pregwood
Resaprest
Sweet Home Brand
Syroco
Weldwood
Woodex
Woodite

Producers of Plastics and Other Nonmetallics

A

American Cyanamid Co., Plastics Div., 30 Rockefeller Plaza, New York.
Urea-formaldehyde plastic—BEETLE
Melamine-formaldehyde plastic—MELMAC
Thermosetting material—LAMINAC

American Felt Co., Glenville, Conn.
Felt material—"K" FELT and AMERICAN FELT
See advertisement, Page 302

American Hard Rubber Co., 11 Mercer St., New York.
Hard rubber—ACE

American Plastics Corp., 225 W. 34th St., New York.
Casein thermoplastic—AMEROID

American Plywood Corp., New London, Wis.
Phenolic urea plywood—AMERICAN PLYWOOD

American Products Mfg. Co., Oleander and Dublin Sts., New Orleans.
Cellulose derivative—INCELOID

American Resinous Chemicals Corp., Peabody, Mass.
Synthetic rubber-soya material—VULPRENE

American Wringer Co. Inc., Woonsocket, R. I.
Rubber and rubber synthetics—TENSILASTIC

Am-mex Sales Co. Inc., 28 Church St., Buffalo.
Plastic-bonded plywood — SWEET HOME BRAND

Armstrong Cork Co., Lancaster, Pa.
Cork compositions, fibrated leather, cork-and-rubber compositions, synthetic rubber compounds, rag felt papers, and cork-and-synthetic-rubber compositions — ARMSTRONG'S
Resilient board of cork granules—VIBRACORK
See advertisement, Page 258

Atlas Powder Co., Zapon-Keratol Div., Stamford, Conn.
Cloth- ba s e-and-Bakelite-resinous plastic—REVOLITE

B

Bakelite Corp., 30 E. 42nd St., New York.
Phenolic, urea, cast resin plastics, and polystyrene plastics—BAKELITE

Booth Felt Co., 444 19th St., Brooklyn, N. Y.
Wool base felt—BOOTH FELT

Bound Brook Oil-Less Bearing Co., Bound Brook, N. J.
Material for impregnated wood bushings, etc. —NIGRUM
See advertisement, Page 302

Brandywine Fibre Products Co., 14th and Walnut Sts., Wilmington, Del.
Paper-base material—BRANDYWINE FIBRE

C

Carbide & Carbon Chemicals Corp., 30 E. 42nd St., New York 17.
Thermoplastic materials—VINYLITE and POLYETHYLENE
See advertisement, Page 311

Catalin Corp., 1 Park Ave., New York.
Phenolic plastics—CATALIN and CATABOND
Styrene plastics—LOALIN

Celanese Celluloid Corp., Plastic Div., Celanese Corp. of America, 180 Madison Ave., New York.
Cellulose acetate plastic—LUMARITH
Cellulose nitrate plastic—CELLULOID
Cellulose acetate (transparent) sheet—LUMARITH
See advertisement, Page 152

Central Paper Co. Inc., 2400 Lakeshore Drive, Muskegon 28, Mich.
Wood-cellulose fiber material—CENTRALINE

Chemaco Corp., Berkeley Heights, N. J.
Cellulose-acetate, ethyl-cellulose, polystyrene and vinyl compound materials—CHEMACO

Chemical Research Corp., P. O. Box No. 2002, Tulsa 1, Okla.
High-strength plastic—RESISTAL

Chicago Rawhide Mfg. Co., 1301 Elston Ave., Chicago.
Synthetic rubber compounds—SIRVENE
Heat-resisting leather—SIRVIS

Ciba Products Corp., 77-79 River St., Hoboken, N. J.
Aniline-formaldehyde resin—CIBANITE

Cleaveland Laboratories & Mfg. Co. Inc., Holland Ave., Peapack, N. J.
Vinyl resin coatings—CLEARSEAL

Colonial Insulator Co., The, Akron, O.
Ceramic material—COLONIAL CERAMICS

Colt's Patent Fire Arms Mfg. Co., 17 Van Dyke Ave., Hartford, Conn.
Hard rubber and asbestos base material—VULCABESTON

Columbian Rope Co., Auburn, N. Y.
Phenolic resin base—CO-RO-LITE

Continental-Diamond Fibre Co., Newark, Del.
Phenolic plastic—DILECTO, CELORON
Resinous plastic—VULCOID
Vulcanized fibre—DIAMOND
Mica material—MICABOND
Insulating material—DILECTENE

Continental Rubber Works, 1902 Liberty St., Erie, Pa.
Mechanical rubber—VITALIC

Corning Glass Works, Corning, N. Y.
Glass material—PYREX and VYCOR

Cutler-Hammer Inc., 12th and St. Paul, Milwaukee.
Bituminous plastic—THERMOPLAX
Asbestos base material—PYROPLAX

D, E

Densewood Corp., The, Elkhorn, Wis.
Impregnated wood—DENSEWOOD

Dow Chemical Co., Midland, Mich.
Plastic granules—ETHOCEL
Thermoplastic—STYRON and SARAN
Elastomer—STYRALOY
See advertisement, Page 289

Du Pont de Nemours, E. I., & Co. Inc., Wilmington 98, Del.
Chloroprene rubber—NEOPRENE
Plastic coated wire mesh—CEL-O-GLASS
Nitrocellulose base—PYRALIN
Polymethyl-methacrylate base—LUCITE
Cellulose acetate base—PLASTACELE
Polyvinyl alcohol—PVA
Thermoplastic—NYLON and POLYTHENE
Polyvinyl acetate—DUPONT POLYVINYL

Durez Plastics & Chemicals Inc., North Tonawanda, N. Y.
Phenolic plastic—DUREZ

Durite Plastics Inc., 5000 Summerdale Ave., Philadelphia.
Phenol-furfural plastic—DURITE

Extruded Plastics Inc., Norwalk, Conn.
Thermoplastics—TULOX

F

Farley & Loetscher Mfg. Co., Dubuque, Iowa.
Phenolic and urea plastic—FARLITE
Fabric base, thermosetting plastic—FARLITE Gear Stock
Abrasive surface, phenol-formaldehyde—FARLITE Safety Treads
Wood veneers, laminated and impregnated—FARLITE COMPREG

Felters Co., 210 South St., Boston.
Felt for vibration, isolation, etc.—UNISORB
Felt for grease and oil retention—FELTERS FELT and DUFELT
See advertisement, Page 284

Fidelity Felt & Mfg. Co., Front & Venango Sts., Philadelphia 40.
Felt—FIDELITY Felt

Firestone Tire & Rubber Co., Akron, O.
Synthetic rubber—BUTAPRENE

Formica Insulation Co., 4613 Spring Grove Ave., Cincinnati, O.
Laminated resinous plastic—FORMICA
Phenolic impregnated wood—PREGWOOD
See advertisement, Page 161

Franklin Fibre-Lamitex Corp., 190 E. 12th St., Wilmington, Del.
Laminated phenolic—LAMITEX

G

Garfield Mfg. Co., Garfield, N. J.
Thermosetting materials — GUMMON (black); HEMIT (gray-white); TEGIT (phenolic binder) and GARIT

Gemloid Corp., 79-10 Albion Ave., Elmhurst, L. I., N. Y.
Tubing and gasketing material—GEMFLEX
Thermoplastic material—GEMLOID
Acrylic butyrate, thermoplastic—GEMLITE

General Ceramics Co., 30 Rockefeller Plaza, New York.
Ceramic material—CERAWARE

General Ceramics & Steatite Corp., Keasbey, N. J.
Ceramic material—STEATITE

General Electric Co., 1 Plastics Ave., Pittsfield, Mass.
Nonrefractory and refractory materials—TEXTOLITE; Two types
Ceramic base—MYCALEX
See advertisement, Page 293

General Tire & Rubber Co., Mechanical Goods Div., Wabash, Ind.
Natural and synthetic rubber combined with Metal—SILENTBLOC
Rubber—GENERAL
See advertisement, Page 252

Goodrich, B. F., Co., Akron, O.
Synthetic rubbers—AMERIPOL and KOROSEAL
Polyvinyl resins—GEON

Goodyear Tire & Rubber Co., Akron, O.
Synthetic rubber—CHEMIGUM

H

Harris Products Co., 5105 Cowan, Cleveland.
Rubber and metal vibration insulators—DUFLEX
Rubber and metal flexible bearings—TORFLEX

Haskelite Mfg. Corp., Grand Rapids 2, Mich.
Resin-bonded plywood—HASKELITE, PLYMETL, PLYMOLD, PLASTIPLY and PHEMALOID
Lignin enriched press paper base—LIGNOLITE

Hodgman Rubber Co., Farmingham, Mass.
Thermoplastic—SARAN

Hycar Chemical Co., Akron, O.
Synthetic rubbers—HYCAR
See advertisement, Page 145

I

Illinois Electric Porcelain Co., Macomb, Ill.
Ceramic base material—ILLINOIS Chemical Porcelain

Industrial Synthetics Corp., Irvington, N. J.
Rubber-like synthetics—SYNFLEX

Ingersoll Plastics Co., 11 West 42nd St., New York.
Fibrous, thermosetting material—PLASTROX "B"

Irvington Varnish & Insulator Co., Irvington, N. J.
Flexible extruded plastic tubing—HYFLEX, IRV-O-LITE, IVI-FLEX and TRANSFLEX
Flexible varnished tubing—IRV-O-VOLT, RS and FV
Insulating paints, enamels—IRVINGTON
Insulating punchings—IRVINGTON
Insulating varnishes—IRVINGTON and HARVEL
Transformer lead tubing—IRVINGTON
Varnished fabrics and papers—IRVINGTON
Varnished slot insulation—IRV-O-SLOT
Plastic and varnished wire markers—IRVINGTON
Plastic insulating tape—FIBRON
Resins—CARDOLITE

J

Jamestown Veneer & Plywood Corp., Box 581G, Jamestown, N. Y.
Plywood—JAMESTOWN

Johns-Manville, 22 E. 40th St., New York 16.
Diatomaceous silica material—CELITE
Rubbery, asphaltic-asbestos material—AERTITE
Asbestos, fiber, graphite and rubber compound—EEL-SLIP
Weatherproof coating—INSULKOTE
Refractory material—FIRECRETE

K

Keasbey & Mattison Co., Ambler, Pa.
Asbestos materials—HY-TEMP and FEATHERWEIGHT

Keyes Fibre Co., Waterville, Me.
Phenolic fiber base—KYS-ITE K-100

Knight, Maurice A., Co., 175 Kelly Ave., Akron 9, O.
Resinous thermoplastic—PERMANITE

Kopp Glass Inc., Swissvale, Pa.
Industrial glass—KGI
See advertisement, Page 149

L

Lenoxite Div., Lenox Inc., 65 Prince St., Trenton, N. J.
Ceramic insulating material—LENOXITE

Libbey-Owens-Ford Glass Co., Nicholas Bldg., Toledo, O.
Figured and wire glass—BLUE RIDGE
Polished plate glass—TUF-FLEX and LOF
Glass with metal edge seal—THERMOPANE
Heat-absorbing plate glass—L-O-F
See advertisement, Page 272

Plaskon Division, Libbey-Owens-Ford Glass Co., 2112 Sylvan Ave., Toledo, O.
Thermosetting plastics—PLASKON

Lignum-Vitae Products Corp., 96-100 Boyd Ave., Jersey City, N. J.
Tropical wood—LIGNUM-VITAE

Lord Mfg. Co., Erie, Pa.
Rubber bonding—LORD
See advertisement, Page 166

Luzerne Rubber Co., Dewey St., Trenton, N. J.
Hard rubber, thermoplastic—LUZERNE HARD RUBBER

M

Makalot Corp., 262 Washington St., Boston 9.
Phenolic and urea compounds and resins—MAKALOT
Thermosetting material—K.E.M.

Marathon Chemical Co., Div. of Marathon Paper Mills Co., Rothschild, Wis.
Lignin plastic—LIGNOLITE

Mica Insulator Co., 200 Varick St., New York.
Phenolic and urea-base plastic—LAMICOID

Monsanto Chemical Co., Plastics Div., Springfield, Mass.
Cellulose nitrate plastic—NITRON
Cellulose acetate—FIBESTOS
Phenolic plastic—RESINOX
Polyvinyl acetal plastic—SAFLEX
Polystyrene, thermoplastic—LUSTRON
High heat-resistant thermoplastic—CEREX
Cellulose filled melamine-formaldehyde—RESIMENE 803A

N, O

National Carbon Co. Inc., 30 E. 42nd St., New York 17.
Carbon or graphite in amorphous or graphitic form—NATIONAL CARBON
Porous graphite—GRAPHICELL
Porous carbon—CARBOCELL
Carbon-graphite base impervious material—KARBATE

National Vulcanized Fibre Co., Wilmington, Del.
Laminated Bakelite—PHENOLITE
Cotton cellulose base, vulcanized fiber—NATIONAL FIBRE, NATIONAL SWITCH INSULATION
Cotton-rag base, fish-paper insulation—PEERLESS
See advertisement, Page 266

Neveroil Bearing Co., Wakefield, Mass.
Impregnated maple bearings—WOODEX

Nixon Nitration Works, Nixon, N. J.
Cellulose acetates—NIXONITE and NIXONOID

Ohio Rubber Co., Willoughby, O.
Synthetic rubber—ORCO
See advertisement, Page 155

Owens-Corning Fiberglas Corp., Toledo, O.
Glass, in fiber form—FIBERGLAS
See advertisement, Page 290

P

Penn Fibre & Specialty Co., 2030 E. Westmoreland St., Philadelphia 34.
Phenolic base material—PHENOL FIBRE
Paper base material—PENN Vulcanized Fibre

Pittsburgh Plate Glass Co., Grant Bldg., Pittsburgh.
Laminated plate glass—DUPLATE, DUOLITE, AEROLITE, MULTIPLATE, FLEXSEAL
Heat-treated Plate Glass. HERCULITE
Allyl resin monomers—ALLYMER

Plastic Fabricators Inc., 440 Sanson St., San Francisco.
Cellulose acetate thermoplastic—DURASHIELD

Plastics Industries Technical Institute, 186 S. Alvarado Blvd., Los Angeles.
Liquid furfural resin—RESIN X

Plax Corp., 133 Walnut St., Hartford 1, Conn.
Thermoplastic materials—PLAX Polystyrene and PLAX POLYFLEX

Pluswood Inc., Oshkosh, Wis.
Resin-impregnated plywood—PLUSWOOD

Plylock Corp., subsidiary of M & M Wood Working Co., Portland, Ore.
Phenol-formaldehyde bonded exterior plywood—RESN-PREST

Polaroid Corp., Cambridge, Mass.
Light-polarizing glass—POLAROID

The Porcelain Insulator Corp., Lima, N. Y.
Ceramic base material—PINCO Porcelain

Price Associates, M. B., 350 Fifth Ave., New York.
Rubber-like, vinyl base plastic—TEXRUB

R

Reichhold Chemicals Inc., 601 Woodward Heights Blvd., Detroit 20.
Thermosetting material—PLYOPHEN

Reilly Tar & Chemical Corp., Merchants Bank Bldg., Indianapolis.
Phenolic plastic—INDUR and INDUR VARNISH

Resinous Products & Chemical Co., 222 West Washington Sq., Philadelphia 5.
Plastic bonded plywoods — AMBERLITE, TEGO and UFORMITE
Vulcanizable resinous polyester—PARAPLEX

Resistoflex Corp., Belleville, N. J.
Synthetic resin base—RESISTOFLEX
Modified polyvinyl alcohol base—COMPAR
See advertisement, Page 256

Respro Inc., Wellington Ave., Cranston 10, R. I.
Thermoplastic—RESPROID

Richardson Co., The, Melrose Park, Ill.
Thermosetting, thermoplastic and translucent plastics—INSUROK
Hard rubber—RUB-TEX and RUB-EROK
Acid-resisting bituminous plastic—EBROK
See advertisement, Page 254

Rohm & Haas Co. Inc., 222 W. Washington Sq., Philadelphia 5.
Acrylic base plastic—PLEXIGLAS
See advertisement, Pages 262, 263

Ryerson & Son Inc., Jos. T., 16th and Rockwell Sts., Chicago.
Bearing material—RYERTEX
See advertisement, Page 307

S

Panelyte Div., St. Regis Paper Co., 230 Park Ave., New York.
Laminated resinous thermosetting material—PANELYTE
See advertisement, Page 265

Sandee Mfg. Co., 3945 N. Western Ave., Chicago.
Thermoplastics—SANDEE

Sherwin-Williams Co., The, 101 Prospect Ave., N.W., Cleveland.
Vulcanizable polymer derived from vegetable oils—KEM-POL

Snedaker, Frank C., & Co. Inc., 9th and Tioga Sts., Philadelphia 40, Pa.
Resin-bonded plywood—PLYCRAFT

Southern Friction Materials Co., Charlotte, N. C.
Cotton fabric base with resinous impregnation—COTTONLEATHER

Spaulding Fibre Co. Inc., Tonawanda, N. Y.
Fibrous material — SPAULDING FIBRE, SPAULDING ARMITE and SPAULDO
Phenolic plastic—SPAULDITE

Sponge Rubber Products Co., Derby, Conn.
Hard and soft rubber—CELL-TITE
See advertisement, Page 274

Stanco Distributors Inc., 26 Broadway, New York 4.
Nonvulcanizing plastic—VISTANEX
Synthetic rubbers—BUTYL and PERBUNAN

Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.
Steatite ceramic—STUPAKOFF No. 621

Surprenant Electrical Insulation Co., Ben, Mass.
Thermosetting material—SURCO AMERICAN

Synthane Corp., Oaks, Pa.
Laminated Bakelite—SYNTHANE

Syracuse Ornamental Co., Syracuse, N. Y.
Molded wood—SYROCO and WOODITE

T, U

Taylor Fibre Co., Norristown, Pa.
Phenolic base thermosetting material—TAYLOR FIBRE
See advertisement, Page 171

Technical Ply-Woods, 228 N. LaSalle St., Chicago 1.
Plywoods—DENS-TECH, DIE-TECH, FYBR-TECH, PLY-TECH and PREG-TECH

Tennessee Eastman Corp., Kingsport, Tenn.
Cellulose ester plastics—TENITE

Thiokol Corp., Trenton, N. J.
Synthetic rubber—THIOKOL

United States Graphite Co., Saginaw, Mich.
Carbon-graphite—GRAPHITAR
See advertisement, Page 251

United States Plywood Corp., 46th St. and 12th Ave., New York.
Resin-bonded plywood—WELDWOOD
Metal-covered plywood—ARMORPLY

U. S. Rubber Co., 1230 Sixth Ave., New York.
Synthetic rubber—U. S. RUBBER
See advertisement, Page 288

United States Stoneware Co., Akron, O.
Chemical Stoneware—"U.S." STANDARD
Ceramic, nonplastic—VITRIC-10
Resinous thermoplastic—RESILON
Synthetic resins—TYGON
Resinous thermosetting — REANITE and DURALON

Universal Clay Products Co., The, Sandusky, O.
Ceramic material — UNIVERSAL PORCELAIN

V, W

Valentine Sugars, Lockport, La.
Thermosetting materials—VALITE

Victor Mfg. & Gasket Co., 5750 Roosevelt Rd., Chicago.
Compressed sheet packing—VICTOPAC
Vegetable fiber base sheet packing—VICTORITE
Asbestos sheet—VICTOR
Cork sheet—VICTOR
Compounded synthetic rubber — VICTOPRENE
Synthetic rubber—VICTOLENE

Watertown Mfg. Co., Watertown, Conn.
Phenolic, thermosetting material—NEILITE

Werner Co. Inc., R. D., 380 Second Ave., New York.
Thermoplastic, flexible tubing—PLASTIK-FLEX

Western Felt Works, 4117 Ogden St., Chicago.
Felt material — WESTFELT, GASKOFELT and RESISTOFELT
Synthetic rubber—ACADIA
See advertisement, Page 304

Westinghouse Electric & Mfg. Co., Derry, Pa.
Ceramic base—PRESTITE

Westinghouse Electric & Mfg. Co., Trafford, Pa.
Phenolic plastic—MICARTA
See advertisement, Page 151

Wilmington Fibre Specialty Co., Wilmington, Del.
Paper base material—FYBEROID
Cotton rag and paper, nonplastic — WILMINGTON FIBRE
Phenolic plastic—OHMOID

Stampings Producers

Reference letters beneath addresses of companies refer to: (a) Types, materials and sizes of stampings; (b) Names of stamped machine parts customarily produced; and (c) Machining, heat-treating or assembling facilities.

A

Accurate Spring Mfg. Co., 3811 W. Lake St., Chicago.
(a) Blanking, forming and perforating all metals, small and medium sizes, specializing in spring materials.
(b) To customers' specifications.
(c) Complete facilities.

Ace Mfg. Corp., 1201 E. Erie Ave., Philadelphia.
(a) Blanking, forming and extruding, in pieces 8-12 in. in size, to 75-ton pressure and 2 in. depth of draw.
(b) To customers' specifications.
(c) Machining and grinding.

Acme Mfg. & Gasket Co., 738-40 N. 41st St., Philadelphia 4.
(a) Flat stampings in steel, brass, copper, lead and other metals.
(b) Washers, shims, punches and dies, etc.
(c) Information not available.

Adams, S. G., Metalware Co., 2947 Delmar Ave., St. Louis.
(a) Flat, drawn and formed stampings in steel, brass, copper, stainless steel, monel, inconel; 12 gage and lighter to 5 in. deep x 30 x 60 in.
(b) To customers' specifications.
(c) Finishing facilities.

Advance Stamping Co., 7075 Lyndon Ave., Detroit.
(a) Terminals, small drawn shells in steel, carbon and stainless steel, brass, copper, aluminum and monel metals; shells $\frac{7}{8}$-1½ diam. Largest blank 16 gage, 2½ diam.
(b) Small parts for electrical equipment, etc.
(c) None.

Alofs Mfg. Co., 1615 Madison Ave., S. E., Grand Rapids 7, Mich.
(a) Drawn and formed stampings in steel, brass and aluminum. Drawn 2 in. deep; formed, 60 tons pressure or less.
(b) Automotive and other miscellaneous parts.
(c) Hardening, machining and welding facilities.

Aluminum Goods Mfg. Co., Washington St., Manitowoc, Wis.
(a) Stampings, spinnings and deep drawings in aluminum, stainless steel and other metals.
(b) Refrigerator, radio, textile, electrical, airplane and automotive parts.
(c) Machining, heat-treating, welding.

American Central Mfg. Corp., Connersville, Ind.
(a) Flat, drawn and formed stampings of hot and cold rolled steel, vitreous enameling, stainless steel and aluminum. All up to 10 ft. long.
(b) To customers' specifications.
(c) Complete facilities.

American Emblem Co. Inc., Box D 116, Utica, N. Y.
(a) Art metal and intricate stampings up to 16 in. square; .003 to .25-in. metal thickness.
(b) Embossed nameplates, radio escutcheons and dials and ornamental trim and stampings.
(c) Complete facilities.

American Pulley Co., 4200 Wissahickon Ave., Philadelphia.
(a) Pressed steel stampings in light to heavy steel gages; also deep drawn stampings.
(b) To customers' specifications.
(c) Complete facilities.

American Stamping Co., Battle Creek, Mich.
(a) Flat, drawn and formed stampings in all metals, small and medium. Extra deep drawing a specialty.
(b) Grease cups, oil cups, and automotive, radio and aircraft parts.
(c) Complete facilities.

American Stamping Co., The, 978 E. 64th St., Cleveland.
(a) Flat, drawn and formed stampings in steel, aluminum, brass and copper metals. 24 gage to ¼ in. in thickness, and to 24 in. in diam.
(b) Brake backing plates and miscellaneous parts.
(c) None.

Angell Mfg. Co., P. O. Box 583, Dayton 1, Ohio.
(a) Embossed, flat, drawn and formed stampings in brass, aluminum, steel and zinc; 8 x 4 in. max.
(b) Embossed, etched and lithographed nameplates and labels, small instrument parts, washers, etc.
(c) Machining, finishing and heat treating facilities.

Auburn Shank Co., 7 Columbus St., Auburn, N. Y.
(a) Flat, shallow drawn in small size, and formed stampings in steel and brass. Max. sizes, approx. 5 in. in diam., approx. 8 in. in length strips and approx. ⅛ in. in thickness.
(b) Steel shoe shanks, pressure levers for automotive clutches, inserts, clamps, housings, etc.
(c) Heat-treating facilities.

Auto Sun Products Co., The, 529 Poplar St., Cincinnati 14.
(a) Flat, drawn and formed stampings, 30 gage to 5/16 in. thick, to 12 in. in diam.
(b) Radio, refrigerator, automotive, washing machines parts, etc.
(c) Assembling, finishing and welding.

B

Badger Tool & Mfg. Co., 1501 W. Polk St., Chicago 7.
(a) Flat, drawn and formed stampings in steel, brass, bronze and aluminum, in sizes to 12 in. in diam.
(b) Automotive and radio parts.
(c) Complete facilities.

Barnes-Gibson-Raymond Div., Associated Spring Corp., 6391 Miller Ave., Detroit. (The Cook Plant—Ferry Field and Boulevard drive, Ann Arbor, Mich.)
(a) Small flat springs and stampings from carbon and alloy steels and nonferrous metals.
(b) Special small stampings, formed flat wire parts, catches, clips, contacts, snap rings, retainers and washers.
(c) Complete facilities.

Barth Mfg. Co., 1826 Columbus Rd., Cleveland, O.
(a) Small and medium (120 ton press largest) flat, pierced, drawn and formed stampings of steel, aluminum, brass, copper and stainless steel.
(b) Electrical and refrigerator parts, etc.
(c) Machining and assembling facilities.

Basca Mfg. Co., Inc., 3019 Roosevelt Ave., Indianapolis 1.
(a) Tube forming and small flat, drawn, formed stampings of cold-rolled and hot-rolled pickled steel up to No. 12 USS gage steel; small and medium sized.
(b) Automotive muffler parts.
(c) Machining and assembling facilities.

Beehler Steel Products Co., 1400 Kingsland Ave., St. Louis 14.
(a) All types of stampings except deep drawn, in steel and other metals, 24 x 36 in. and smaller—presses, 120 tons and lighter.
(b) Cams, links, cups, etc.
(c) Limited facilities.

Behringer Metal Works Inc., 108-122 Jabez St., Newark 5, N. J.
(a) Flat, drawn, formed, etc., of steel, brass, aluminum, stainless steel, to 24 x 48 inches in size. Formed sections to 20 ft. long.
(b) Miscellaneous, to customer's specifications.
(c) Complete facilities.

Blake Mfg. Corp., Green St., Clinton, Mass.
(a) Flat and drawn stampings in brass, copper, nickel, steel, aluminum and zinc; also embossed stampings; drawn tubes up to 7 in. long, 2½ in. in diam. Small stampings made from light gage metal.
(b) Small-sized metal stampings to customers' specifications.
(c) Complete facilities.

Bossert Co. Inc., The, 1002 Oswego St., Utica, N. Y.
(a) Stampings from .005 to 1 in. in thickness, in any metal.
(b) Automotive, refrigeration, washing machine, radio, etc.
(c) Assembling and welding facilities.

Boehm Pressed Steel Co., The, 2219 W. 63rd St., Cleveland 2.
(a) Flat, drawn and formed stampings in steel, brass, copper, aluminum and stainless steel in small and medium sizes.
(b) To customers' specifications.
(c) None.

Bowen Products Corp., Auburn Div., Auburn, N. Y.
(a) Flat, deep drawn and formed stampings in steel, copper, brass, nickel and silver; also coined parts. Deep drawn, to 4 in. in diam. x 6½ in. long, coined parts, to ½ in. in thickness.
(b) Grease cups, oil cups, centralized oiling systems and special stampings of all types.
(c) Machining and assembling facilities.

Brewer-Titchener Corp., The, 111 Port Watson St., Cortland, N. Y.
(a) Flat, formed, and drawn stampings of ferrous and nonferrous, stainless, etc., up to 30 x 60 in. in size and 4 in. max draw.
(b) To customers' specifications.
(c) Complete facilities.

Bridgeport Chain & Mfg. Co., The, Bridgeport, Conn.
(a) Small, flat stampings of steel, brass and bronze, to .065 in. gage, 4 in. length or diam.
(b) To customers' specifications.
(c) Complete facilities.

Buckeye Stamping Co., The, 555 Marion Rd., Columbus 7, Ohio.
(a) Seamless flat, deep drawn and formed stampings in tin plate, black plate, aluminum and steel, about 18 gage and lighter. Sizes for drawn, to 6 in. in diam.; for flat, approx. to 10-12 in. x 6-8 in.
(b) Light metal stampings of all types.
(c) Machining facilities.

Budd, Edward G., Mfg. Co., Philadelphia, (Detroit plant located at 13141 Charlevoix Ave.)
(a) Automobile body and large and small special stampings of mild and stainless steels.
(b) Automotive, process industries, railway

passenger car, commercial truck trailer, marine and aircraft parts.
(c) Complete facilities.

Buffalo Brake Beam Co., 140 Cedar St., New York.
(a) Small stampings from light bars and strip stock.
(b) To customers' specifications.
(c) Information not available.

Burgess-Norton Mfg. Co., Geneva, Ill.
(a) Steel stampings to .35 carbon; flat drawn to 3 in. and formed (press operations from 10-100 tons—largest bed plate 16 x 16 in.).
(b) Farm and automotive equipment, washing machine, lawn mower and refrigerator parts.
(c) Complete facilities.

By-Products Steel Corp., Coatesville, Pa.
(a) Flat plates pressed, bent, sheared or blanked, and flame-cut steel shapes, in gages from No. 10 to 25 in. thick.
(b) To customers' specifications.
(c) Information not available.

C

Chase Brass & Copper Co. Incorporated, 236 Grand St., Waterbury 91, Conn.
(a) All types sheet metal stampings, drawn shells of brass, copper and copper alloys.
(b) All types of parts.
(c) Machining, polishing, plating and assembling facilities.

City Auto Stamping Co., Lint and Dura Ave., Toledo, O.
(a) Large light-gage stampings.
(b) Automotive tractor and refrigerator parts.
(c) Assembling facilities.

Cleveland Steel Products Corp., Plant No. 2, Wellington, O.
(a) All types to 12 in. draw, 12 in. diam., ¼ in. thick.
(b) Automotive, industrial and electrical.
(c) Complete secondary operation, cyanide hardening, plating and assembling.

Cogswell Mfg. Co., 140 Norman St., West Springfield, Mass.
(a) Flat, drawn and formed; of steel, aluminum and brass; 4 x 12 in., to ⅜-inch thick.
(b) Airplane fittings and other machine parts.
(c) Adequate secondary equipment and assembling.

Columbia Metal Stamping Co., The, 11900 Harvard Ave., Cleveland.
(a) Light and medium stampings in all metals to ¼ in. thick, to 24 x 24 in. Deep drawn to 3½ in. deep. ⅛ thick.
(b) Automotive, electrical, industrial and general.
(c) Complete facilities.

Commercial Shearing & Stamping Co., 1773 Logal St., Youngstown, O.
(a) To 60 in., ¾-in. gage, steel and copper alloys, aluminum and stainless steel.
(b) Tank heads and water heater parts.
(c) Machining and assembling facilities.

Continental Machines Inc., 1301 Washington Ave., S., Minneapolis 4.
(a) Flat, drawn, pierced and formed stampings in aluminum, brass, copper and steel, to 16 in. sq. and 1¼ in. deep.
(b) To customers' specifications.
(c) Complete facilities.

Cook Co., The H. C., 28 Beaver St., Ansonia, Conn.
(a) Flat and formed stampings in steel, brass, aluminum, zinc, copper and nickeloid; small and medium sizes.
(b) To customers' specifications.
(c) Complete facilities.

Croessant Machine Works, 39-41 Moss St., Reading, Pa.
(a) Light sheet metal stampings in all materials, up to 60 tons.
(b) To customers' specification.
(c) Information not available.

Crosby Co., 183 Pratt St., Buffalo 5.
(a) All types of stampings in steel, brass, copper, aluminum, etc., in any size.
(b) To customers' specifications.
(c) Complete facilities.

Crowe Name Plate & Mfg. Co., 3701 Ravenswood Ave., Chicago 13.
(a) Flat, drawn and formed stampings in brass, bronze, steel, aluminum and zinc; sizes made to customers' specifications.
(b) Metal cabinets, panels and various machine parts.
(c) Complete facilities.

Cuyahoga Spring Co., The, 10301 Berea Rd., Cleveland.
(a) Stampings of cold-rolled steel, up to No. 10 gage; flat springs stamped or formed and tempered for mechanical purposes; also brass, bronze, stainless steel and beryllium copper stampings.
(b) Primarily flat springs.
(c) Complete facilities.

D

Dahlstrom Metallic Door Co., Buffalo St., Jamestown, N. Y.
(a) Steel, stainless steel, brass, bronze, aluminum stampings and drawn parts. Press equipment Bliss 3-B to 8-E, Toledo press (bed 88 in. x 44 in.), brake presses for sections 10 to 12 ft. long.
(b) Machine guards, cabinets, latches, brackets and special parts.
(c) Assembling facilities.

Dayton Rogers Mfg. Co., 2835 12th Ave., Minneapolis.
(a) Stampings of steel, brass, copper and other sheet alloys, as well as bakelite and similar synthetics.
(b) Metal stampings in small lots for the aircraft industries including all instruments and other stamped products required in limited quantities.
(c) Complete facilities.

Dellinger Mfg. Co., 725 N. Prince St., Lancaster, Pa.
(a) Flat and formed; of steel, copper, and aluminum; to fit presses up to 100-ton capacity with bottom area of 30 x 40.
(b) Electric controller parts, radio, etc.
(c) Assembling and welding facilities.

Detroit Stamping Co., 350 Midland Ave., Detroit 3.
(a) Flat, drawn to 2½ deep, formed, coined; of steel and alloys, annealed and tempered, and nonferrous metals; small and medium, to 2 x 3 ft.
(b) Pressed metal parts for all types of machines; spacers, shims, washers, etc.
(c) Light machining and assembling.

Dickey-Grabler Co., 10302 Madison Ave., Cleveland.
(a) Metal stampings, 20-150 ton presses.
(b) Various machine parts.
(c) Assembling, riveting, welding.

Dunbar Brothers Co., Div. of Associated Spring Corp., Bristol, Conn.
(a) Flat and formed stampings of spring steel, stainless and other alloys in small sizes.
(b) To customers' specifications.
(c) Heat-treating facilities.

E, F

Eastern Tool & Stamping Co. Inc., 110 Ballard St., Saugus, Mass.
(a) Flat, deep drawn and formed stampings in steel, brass, copper, aluminum, nickel and zinc; small, medium and large sizes.
(b) Electrical, textile, automotive, radio parts, etc.
(c) Heat-treating and welding facilities.

Eaton Mfg. Co. Stamping Div., 755 E. 140th St., Cleveland.
(a) All type stampings, excepting long draws; of steel, brass and aluminum; in small and medium sizes (to 15-inch blank).
(b) Gas, oil and radiator caps and necks, etc.
(c) Trimming, facing, threading, plating, assembling.

Edwards Mfg. Co., 529-49 Eggleston Ave., Cincinnati, O.
(a) Drawn and formed steel, copper, zinc, aluminum, and brass stampings, to 40 x 108 in.
(b) To customers' specifications.
(c) Spinning, welding, finishing, machining.

Erie Art Metals Co., 18th & Schaal Ave., Erie, Pa.
(a) Flat and formed stampings, press brake shapes, 10 ft.; other stampings, 125 ton press.
(b) To customers' specifications.
(c) Heat-treating and finishing facilities.

Esmco Auto Products Corp., 33 34th St., Brooklyn, N. Y.
(a) Flat, drawn and formed stampings in all metals up to 3/16 in. in thickness; sizes of stampings up to 20 x 24 in.
(b) To customers' specifications.
(c) Assembling, finishing and machining.

Eureka Tool & Machine Co., 17 W. 54th St., New York.
(a) Small and medium stampings.
(b) To customers' specifications.
(c) Complete facilities.

Evans, George, Corp., The, 121 37th St., Moline, Ill.
(a) Flat, drawn and formed stampings in steel, brass and aluminum; sizes of stampings to 3/16 in. in thickness, 4 feet in width, and 12 in. in depth.
(b) Automotive, farm equipment and communication equipment parts.
(c) Complete facilities.

Falstrom Co., 34 Main Ave., Passaic, N. J.
(a) Fabricated steel parts of all kinds.
(b) Machine bases, frames, guards, instrument panels, etc.
(c) Machining and assembling facilities.

Faries Mfg. Co., Decatur, Ill.
(a) Flat, drawn and formed stampings in brass, steel and aluminum; medium sizes up to 15 in. in diam. and 10 in. deep, from .050 metal.
(b) Various machine parts.
(c) Complete facilities.

Firestone Steel Products Co., Akron, O.
(a) Flat, drawn, formed, etc.; carbon and alloy steels; small, medium and large.
(b) Automotive, washing machine and conveyor parts, etc.
(c) Complete facilities.

Fox Co., Fox Bldg., Cincinnati.
(a) Metal stampings.
(b) Nameplates, escutcheons, etc.
(c) Assembling facilities.

G, H

G G G Metal Stamping Co., Inc., Warren, Pa.
(a) Flat, formed and drawn stampings in all types of metals to ¼ in. thick material. Largest press, 80 tons.
(b) Blue print dryers, domestic, fire and farm equipment, etc.
(c) Complete facilities.

Geometric Stamping Co., The, 1108 E. 200th St., Cleveland.
(a) Any type stampings in steel, stainless steel, brass, etc., ½ in. thick, 48 x 48 in.
(b) Dairy, washing machine, radio, railroad, automobile parts and assemblies.
(c) Complete facilities.

Geuder, Paeschke & Frey Co., 324 N. 15th St., Milwaukee.
(a) Deep drawn in all metals to 48 in. diam 18 in. deep, 12-30 gage.
(b) Government sheet metal work.
(c) Complete facilities.

Gibson Co., William D., Div. of Associated Spring Corp., 1800 Clybourn Ave., Chicago.
(a) Miscellaneous stampings of cold-rolled spring steel, stainless and alloys, small and medium.
(b) Springs, all flat including Bellevflle.
(c) Heat-treating facilities.

Globe Machine & Stamping Co., The, Div. of Hupp Motor Car Corp., 1250 W. 76th St., Cleveland.
(a) Metal stampings of all sizes.
(b) Stamping assemblies, tumbling and burnishing barrels.
(c) Machining and assembling facilities.

Goat Metal Stampings Inc., 314 Dean St., Brooklyn 17.
(a) Small, flat, drawn, formed, blanks, etc.; of stainless steel, nickel, monel, copper alloys, tin plate, aluminum, etc.; from .002 to ⅛-in. thick, generally under 2 in. wide, max 6 x 12 in.
(b) Electronic parts.
(c) Proper facilities for light work.

Grammes, L. F., & Sons Inc., Allentown, Pa.
(a) Stampings of brass, aluminum, steel, etc.
(b) Automotve, radio, clock and electrical.
(c) Complete facilities.

Gray, Peter, Corp., 290 Third St., Cambridge, Mass.

(a) Steel and nonferrous metals, drawn, stamped and formed, up to 3/16 in. thick; 4 to 400 ton presses with bed areas up to 25 sq ft. Power and hand brakes for 10-gage material by 8 ft long.
(b) Handles, guards, stop motions, meters, fans, covers, radio, refrigerator casings, propeller heads, and textile machine parts.
(c) Complete assembling and finishing.

Gregory Mfg. Co., 67 Franklin St., New Haven, Conn.

(a) Formed and drawn stampings of brass, steel, copper and aluminum. Maximum depth of draw 1¼ in.; small to medium sizes—maximum blank 10 in. x 10 in.
(b) Electric knife switches, spring tension washers, etc.
(c) Complete facilities.

Greist Mfg. Co., The, New Haven, Conn.

(a) Small stampings, specializing on forming operations.
(b) Business machine, photographic, electrical, sewing machine parts and assemblies.
(c) Complete facilities.

Griffith-Hope Co., 6607 W. Mitchell St., West Allis, Wis.

(a) Formed and drawn shapes; 5 in. max depth.
(b) All types of stampings.
(c) Welding, enameling, assembling.

Guarantee Specialty Mfg. Co., The, E. 96th St., Cleveland.

(a) Flat and drawn stampings, drawing not exceeding 4 in. deep; of sheet steel, band iron, sheet and coil brass, copper, bronze and aluminum in small and medium sizes.
(b) Washers, shims, airplane washers, etc.
(c) Heat treating, plating and finishing.

Guth, Edwin F., Co., 2615 Washington Ave., St. Louis 3.

(a) Flat (die punched), deep drawn (12-15 in. deep), and die formed (channels, etc.); of steel, brass, aluminum, copper and stainless steel; in 30-in. diam to less than an inch in size. Also spinning.
(b) Switch parts, fan blades, fabricators, etc.
(c) Machining, assembling and finishing.

Hancock Mfg. Co., 225 N. Horton St., Jackson, Mich.

(a) Flat, drawn and formed stampings of ferrous and nonferrous metals; presses to 100 ton capacity.
(b) Automotive parts to customers' specifications.
(c) Complete facilities.

Heyman Mfg. Co., Michigan Ave., Kenilworth, N. J.

(a) Blanked and formed stampings of strip steel, brass, copper and aluminum to 3/16 in. thick and 6 in. long.
(b) Electrical contacts and aircraft brackets.
(c) None.

Hubbard, M. D., Spring Co., Pontiac, Mich.

(a) Small stampings in spring steels, hot and cold-rolled steel, brass, bronze, aluminum, Monel and stainless steel.
(b) Expansion plugs, washers, flat springs and spring washers.
(c) Drilling, tapping, spot welding, and heat treating.

Hunter Pressed Steel Co., Lansdale, Pa.

(a) All types, small and medium; max 15 in. blank, ⅛ in. stock.
(b) Mechanical coil springs and wire forms.
(c) Complete facilities.

I, K

Indiana Pressed Steel Co., Muncie, Ind.

(a) Medium and medium-large stampings in all metals.
(b) Refrigerator, automotive, radio, electrical, etc.
(c) Complete facilities.

Kees, F. D., Mfg. Co., 24 High St., Beatrice, Neb.

(a) Flat, drawn and formed stampings of light and medium gage in steel, brass, aluminum, copper and zinc; presses to 80 tons x 4 in. stroke, and 50 tons x 5 in. stroke.
(b) Electrical, aircraft, and Army and Navy parts.
(c) Welding and machining facilities.

Kickhaefer Mfg. Co., 901 S. Second St., Milwaukee.

(a) Small and medium stampings of steel, brass, copper and aluminum.
(b) Valve spring washers, special washers, tubing and wire clips, engine front and rear plates, plugs, etc.
(c) None.

Kirk & Blum Mfg. Co., The, 2850 Spring Grove Ave., Cincinnati, O.

(a) Special pressed metal stampings. Presses up to 36 x 84 in., 12 in. stroke; press brakes to 16 ft. to 10 in., 600 tons capacity.
(b) Machine bases, pedestal, guards, lathe pans, truck body and cab parts.
(c Assembling facilities.

Klein Mfg. Co., Burlington, Ia.

(a) Steel and galvanized iron stampings.
(b) To customers' specifications.
(c) Complete facilities.

Klopping, A. C., Stamping Co., 1678 Norwood Ave., Toledo 7, O.

(a) Flat, drawn and formed stampings of steel, brass, aluminum and stainless steel; gage .031 to .50, sizes to 32 x 32 in.
(b) Automotive parts.
(c) Information not available.

Knott, A. J., Tool & Mfg. Corp., 6 Front St., Milford, Mass.

(a) Medium and light metal stampings; in all types, of steel, brass, phosphor bronze, aluminum and nickel-silver.
(b) To customers' specifications.
(c) Heat-treating and assembling facilities.

Konigslow, Otto, Mfg. Co., 3610 Perkins Ave., Cleveland.

(a) Flat, drawn, pierced and formed stampings of steel, brass, copper, aluminum, stainless steel, etc.; small and medium sizes.
(b) All types of parts.
(c) Machining and assembling facilities.

L

LaGanke & Sons Stamping Co., 864 E. 140th St., Cleveland.

(a) Blanked, pierced, formed, drawn, and embossed stampings of stainless steel, steel, brass, copper, aluminum and aluminum alloys, with press capacity to 70 tons.
(b) Internal and external thread protectors, stamped nuts, baffles, ferrules, etc.
(c) Assembling facilities.

Lansing Stamping Co., Lansing, Mich.

(a) Flat, drawn and formed stampings; of steel sheets, strip and plates; small to medium.
(b) To customers' specifications.
(c) Limited facilities.

Larson Tool & Stamping Co., Attleboro, Mass.

(a) All types of stampings in metals from very small to moderately heavy sizes.
(b) All types of machine parts.
(c) Machining and finishing.

Leake Stamping Co., The, 1250 East First St., Monroe, Mich.

(a) Drawn, formed, flat, steel, brass, copper and aluminum stampings in all sizes requiring up to 400-ton pressure with 20-in. stroke.
(b) To customers' specifications.
(c) Welding facilities.

Lee Spring Co. Inc., 30 Main St., Brooklyn.

(a) Flat punched and formed stampings of spring steel, stainless, brass, copper, bronze, etc., from strip material only, up to 3 in. wide.
(b) Spring washers, spring clips, etc.
(c) Heat-treating and finishing facilities.

Lewyt Corp., 60 Broadway, Brooklyn 11, N. Y.

(a) Sheet metal stamping.
(b) Precision machine parts for electrical and electronic industries.
(c) Machining, finishing and assembling facilities.

Liberty Electric Co., 1915-25 Madison Ave., Indianapolis.

(a) Flat, drawn, formed, etc., also spinning to 44-in. diam of stainless steel and all nonferrous metals; flat and formed to 16 x 20 and shallow draws, deep drawing 10-in. diam, 8 ft deep.
(b) To customers' specifications.
(c) Complete facilities.

Lockwood Mfg. Co., The, 3170 Wasson Rd., Cincinnati 8.

(a) Flat, drawn and formed stampings of steel strip, and tin-plate; small to medium. Max drawing depth, 5 in.
(b) All types of stampings.
(c) Welding facilities.

Lorentzen, H. K., Inc., 391 W. Broadway, New York 12.

(a) Flat, formed and shallow drawing stampings of all types of metals (specializing in aluminum and stainless steel); light and medium gages, from .010 in. to .125 in. in thickness.
(b) Chasses, housings, shock mounts, frame works, dust covers, etc.
(c) Machining and welding facilities.

Lukens Steel Co., Coatesville, Pa.

(a) Hot-rolled plates up to 195 inches wide and from 3/16 to 25 in. thick, spun and pressed steel heads and other pressed steel shapes in thicknesses from 3/16-in. to 6 in.
(b) To customers' specifications.
(c) Information not available.

Lyon Metal Products Inc., Aurora, Ill.

(a) Sheet metal stampings in wide range gages, sizes and drawing operations.
(b) Aircraft parts, also parts for ordnance, tanks, ships, etc.
(c) Heat-treating, finishing, annealing, welding.

M

Macnick Co., 510 S. Lansing, Tulsa 5, Okla.

(a) Flat, drawn and formed (with combinations) stampings of all types of metals; 14 gage, limit on draws 2 in.; limit of size and thickness combination of 48 tons pressure.
(b) Clock, instrument and spring motor stampings.
(c) Complete facilities.

Manhattan Perforated Metal Co. Inc., 43-17 37th St., Long Island City 1, N. Y.

(a) Perforations of any type of material and size of sheet and thickness required.
(b) To customers' specifications.
(c) Information not available.

Master Products Co., The, 6400 Park Ave., S. E., Cleveland 5.

(a) Flat and formed miscellaneous small stampings, of nickled, hot and cold-rolled steel and other metals.
(b) To customers' specifications.
(c) Machining and heat-treating facilities.

Matthews Mfg. Co., 104 Gold St., Worcester 3, Mass.

(a) Flat, drawn and formed stampings of steel, brass, copper and aluminum; various sizes, depending on types.
(b) To customers' specifications.
(c) Complete facilities.

Mayer, Geo. J., Co., 15 N. Penn St., Indianapolis 9.

(a) Flat, drawn and formed stampings of zinc, brass, steel and aluminum; 6 x 6 inches.
(b) All types of machine parts.
(c) Information not available.

McCauley Metal Products Inc., 660 Grant St., Buffalo 13.

(a) All types of stampings (specializing in deep drawn), under 16 in. sq; of steel, brass, copper, aluminum, bronze, etc.
(b) To customers' specifications.
(c) Heat-treating and assembling facilities.

Metal Auto Parts Co. Inc., 1428 W. Henry St., Indianapolis 7.

(a) Flat, drawn, deep-drawn and formed light gage stampings of steel and aluminum in medium and large sizes—downward from 16 in. deep and 48 x 96 in. in area.
(b) Automobile fenders, tops, radiator shells, miscellaneous refrigerator, range and household appliance stampings, etc.
(c) Welding and fabricating facilities.

Midland Steel Products Co., Cleveland and Detroit.

(a) Flat, formed and drawn stampings of .05-.3 carbon and high-tensile steels in small, medium and heavy sizes to 25 ft long.
(b) Automotive, lathe pans, etc.
(c) Machining and assembling facilities.

Milcor Steel Co., 4100 W. Burnham St., Milwaukee 4.

(a) Flat, drawn, formed and intricate stampings of all types, in hot and cold-rolled

black galvanized sheets, copper, tin, etc., 10 gage to 30 gage; very small to medium large (6 sq ft max).
(b) To customers' specifications.
(c) Complete machining and assembling.

Milwaukee Metal Spinning Co., 1325 S. 43d St., Milwaukee.
(a) Parts produced by metal spinning from aluminum, brass, copper, steel, magnesium, zinc, stainless steel, Inconel, nickel, monel, nickel-silver, silver, gold, any metal and any alloy. From ⅛-inch to 8 ft diam., depth to 40 in. Aluminum or copper ¼-in. thick. Brass, hard alloys including stainless steel, monel inconel, 3/16-in.
(b) For dairy and food handling equipment, farm machines, electric motors, unit heaters, air conditioning, aircraft, etc.
(c) Complete facilities.

Morrison Products Inc., 16816 Waterloo Rd., Cleveland.
(a) All gages up to ¼ in., deep drawn stampings to 6 in. deep, in steel and other metals.
(b) All types of machine parts.
(c) Complete assembling, spotwelding, riveting, machining and japanning facilities.

Mossberg Pressed Steel Corp., 81 West St., Attleboro, Mass.
(a) Flat, formed and shallow drawn stampings of steel; 36 in. diam max.
(b) Steel spools, reels, textile warp beams and braiding machine carriers.
(c) Machining, heat treating and welding facilities.

Mullins Mfg. Corp., Salem, O. (Another plant at Warren, O.)
(a) Light and heavy-gage stampings, light-gage deep-drawn stampings from 20 to 16 gage in sizes to 80 x 160, depth of draw to 22 in.
(b) Washing machine tubs, steel evaporators and automobile parts.
(c) Assembling facilities.

Murray Corp. of America, 7700 Russell St., Detroit.
(a) Light and heavy sheet metal stampings.
(b) Auto bodies, fenders, hoods, frames, grilles and airplane parts.
(c) Assembling and finishing facilities.

N, O

National Formetal Co., 6539 Metta Ave., Cleveland.
(a) Formed steel, brass and bronze stampings, in diameters from 3/16 in. inside to 5 in. outside, lengths to 14 in.
(b) Bushings, bearings, spacers, grommets, ferrules and tubes, spring clips, etc.
(c) Welding and assembling facilities.

National Stamping Co., 6-30 St. & Jean Ave., Detroit.
(a) Flat, drawn and formed stampings of brass, steel, copper and aluminum up to ¼ in. thick material.
(b) Automotive parts, assemblies and miscellaneous pressed metal parts.
(c) Complete facilities.

New England Pressed Steel Co., Washington Ave., Natick, Mass.
(a) Stampings of steel, brass, copper, stainless steel and aluminum, small and medium.
(b) To customers' specifications.
(c) Heat-treating, finishing and assembling facilities.

New Products Corp., Benton Harbor, Mich.
(a) Flat, drawn and formed stampings of all metals; largest press capacity 125 tons.
(b) Automotive and commercial parts.
(c) Complete facilities.

Noera Mfg. Co., Div. of Chase Brass & Copper Co. Incorporated, Waterbury, Conn.
(a) Medium and light stampings of copper, brass, steel, 14 in. and smaller.
(b) Washers, oilers, etc.
(c) Assembling facilities.

Norris Stamping & Mfg. Co., 5215 S. Boyle Ave., Los Angeles.
(a) All types of sheet metal stampings and deep drawing; ferrous and nonferrous materials; sizes from very small to large.
(b) Subcontract stampings of all types.
(c) Complete facilities.

O. K. Machine Co., Fairfield and Poplar Aves., Fort Wayne, Ind.
(a) Stampings from smallest sizes to not exceeding 24 in. overall and not over 6 in. deep, of steel, brass, copper and aluminum.
(b) Laminations, cups, automatic phonograph and radio, liquid dispensing pump parts, etc.
(c) Complete facilities.

P

Parish Pressed Steel Co., Robeson & Weiser Sts., Reading, Pa.
(a) Soft steel, alloy and stainless steel, and aluminum flat, drawn and formed stampings in all sizes.
(b) Automotive, truck and bus frames, etc.
(c) Complete facilities.

Pawtucket Mfg. Co., P. O. Box 675, Pawtucket, R. I.
(a) Flat stampings of all kinds of materials; round, 6 in. x ½ in. thick, and various other types and sizes.
(b) Various types of machine parts.
(c) Complete facilities.

Penn Rivet Corp., 3rd & Huntingdon Sts., Philadelphia.
(a) Flat and small drawn stampings of coiled flat stock (strip) in steel, brass and copper; in sizes to 1½ x 3 in.
(b) Special types of machine parts.
(c) Complete facilities.

Paul & Beekman Div., Philadelphia Lawn Mower & Mfg. Co., 18th & Courtland Sts., Philadelphia.
(a) Flat, drawn, formed and assembled stampings of steel, copper, brass, aluminum, zinc, bronze, etc.; capacity to 250 tons pressure; to 42 in. by ¼ in. thick material.
(b) Aircraft, Ordnance, Navy, etc.
(c) Complete facilities.

Powell Pressed Steel Co., Hubbard, O.
(a) All types of large or small stampings.
(b) Material handling equipment, automobile, refrigerator, washing machine parts, etc.
(c) Complete facilities.

Precision Metal Workers, 3100 Carroll Ave., Chicago 12.
(a) Flat, drawn and formed stampings of all types of metals; presses to 400 tons, bed area, 6-7 ft.
(b) To customers' specifications.
(c) Complete facilities.

Pressed Steel Tank Co., 1435 S. 66th St., Milwaukee 14.
(a) Cylindrical deep-drawn shells and shapes; of mild and alloy steel, nickel, aluminum, stainless, bronze, 4130, 8630, etc.; approx 5 to 29 in. OD, and 10 to 60 in. depth, 1/16 to ½-in. thick.
(b) Numerous types.
(c) Complete facilities.

See advertisement, Page 148

R

Raymond Mfg. Co., Div. Associated Spring Corp., Corry, Pa.
(a) Small stampings of steel, brass, phosphor bronze, Monel, etc.
(b) Springs (both coil and flat), wire shapes and forms, etc.
(c) Heat-treating facilities.

Reisner, W. H., Mfg. Co. Inc., 240 N. Prospect St., Hagerstown, Md.
(a) Flat and formed stampings, of brass, aluminum and steel, in 4-in. sizes.
(b) To customers' specifications.
(c) Machining and assembling facilities.

Reliable Spring Co., The, 3167 Fulton Rd., Cleveland.
(a) Blanking, forming, cutting of wire and strip in steel, stainless steel, brass, phosphor bronze, etc., flats to 3/32 in. thick x 4 in. diam and wire .006 in. to ⅜ in. diam.
(b) Springs, wire formations, bends, hooks, handles, clips, etc.
(c) Complete facilities.

See advertisement, Page 308

Revere Products Corp., Phoenix, N. Y.
(a) Blanking, forming or drawing from light metals, steel, bronze, copper, stainless steel, aluminum, and brass, blanking to ¼ in. thick, forming to 36 in. long, drawing to 4 in. deep.
(b) Oil retainers, washers, escutcheons, etc.
(c) Complete facilities.

Richmond Brothers Co., 173-75 Chestnut St., Newark 5, N. J.
(a) Flat, formed and shallow drawn stampings in all metals; to 12 in. in size.
(b) To customers' specifications.
(c) Information not available.

Rockford Metal Products Co., 716 Cedar St., Rockford, Ill.
(a) Drawing, forming, piercing of steel, stainless steel, aluminum, brass and zinc, approx. 10 in. diam x 3½ in. cups; up to 16 in. diam or sq. on shallow parts.
(b) Automotive and general stamping.
(c) Plating, riveting, welding, assembling and enameling.

Rockwood Sprinkler Co., 52 Harlow St., Worcester, Mass.
(a) Medium-heavy deep drawing and stamping of hot and cold-rolled steel; .02 to .375-in., ½ to 5 in. diam, 1 to 4 in. deep.
(b) Handles, pipe unions, pipe hangers.
(c) Sherardizing, parkerizing facilities.

Rome-Turney Radiator Co., Rome, N. Y.
(a) Flat, drawn and formed stampings of steel, copper, brass and aluminum; 16 gage and 14 in. in diam, max size.
(b) Heat transfer equipment.
(c) Complete facilities.

Ryerson & Haynes, Inc., 2307 E. Ganson St., Jackson, Mich.
(a) Flat, formed and drawn stampings of steel; in small and medium sizes.
(b) Automotive parts.
(c) Assembling facilities.

S

Santay Corp., 351 N. Crawford Ave., Chicago 24.
(a) Flat, drawn, formed, pierced, rolling and thread rolling; in carbon and stainless steel, aluminum, brass, copper, etc.; blank—steel and aluminum 1/16 in. thick—areas approx. 12 in. sq.
(b) Automotive accessories, exhaust, deflectors, tank caps, radio parts, housings, brackets, coverings, frames, and other mechanical and electromechanical parts.
(c) Machining and assembling facilities.

Scovill Mfg. Co., Waterbury, Conn.
(a) Brass, bronze, nickel silver, copper, aluminum, steel, and other metal stampings, drawn shells, formed parts and metal assemblies, nonferrous forgings.
(b) To customers' specifications.
(c) Complete facilities.

Sheet Metal Specialty Co., 3rd & Liberty Aves., Pittsburgh 30.
(a) Flat, drawn and formed stampings of steel, brass, aluminum and stainless steel; drawn, to 16 gage x 10 in. diam x 14 in. deep; formed, to 16 gage in medium sizes.
(b) To customers' specifications.
(c) Heat-treating and assembling facilities.

Shunk Mfg. Co., Bucyrus, O.
(a) Blanking, forming and perforating, all types of materials.
(b) To customers' specifications.
(c) Complete facilities.

Smith, H. A., Machine Co., 100 Hamilton Ave., Hopewell, N. J.
(a) Flat, drawn, formed; of brass, steel, bronze, beryllium copper and tin plate; to 6 x 6 in.
(b) Covers, housings and gears.
(c) Heat-treating facilities.

Spun Steel Corp., 2037 Dusher Ave., S.W., Canton 6, O.
(a) Flat, drawn formed and roller-formed (Spunsteel process) stampings of steel in gage thickness to .200 in.; drawn cups, 14 in. in diam in 14-gage material.
(b) V-type pulleys, flanged cups and hubs, etc.
(c) Welding, heat-treating, finishing.

See advertisement, Page 273

Standard Stamping Co., Inc., Nashville, Mich.
(a) Flat and formed stampings of steel, brass and bronze in any size that can be made on a 70 ton O.B.I. press.
(b) Spacers, bushings, spring clips, base plugs, etc.
(c) Information not available.

Stanley Works, The, 195 Lake St., New Britain, Conn.
(a) Flat, formed, deep drawn and special hinged stampings of steel, brass and alumi-

num in medium to large sizes.
(b) To customers' specifications.
(c) Machining, heat treating and finishing facilities.

Steel City Electric Co., 1207 Columbus Ave., N.S., Pittsburgh.

(a) Flat, drawn and formed stampings in steel, brass and aluminum in small and medium sizes.
(b) Outlet boxes, covers, switch boxes and electrical fittings.
(c) Heat treating, finishing and assembling facilities.

Stolper Steel Products Corp., 3258 W. Fond du Lac Ave., Milwaukee.

(a) All types of fabricated sheet metal from ¼ in. steel and lighter.
(b) Gas tanks, fenders, hoods, housings, etc., to customers' specifications.
(c) Welding and assembling facilities.

Swanson Tool and Machine Products, 810-14 E. Eighth St., Erie, Pa.

(a) Flat, drawn and formed stampings of all ferrous and nonferrous metals in medium and small sizes, up to 4 in. draw.
(b) To customers' specifications.
(c) Complete facilities.

T

Titchener & Co., E. H., 136 Walnut St., Binghamton, N. Y.

(a) Flat and formed stampings in all metals; up to 5/32 in. thick.
(b) Various.
(c) Finishing facilities.

See advertisement, Page 304

Toledo Stamping & Mfg. Co., 99 Fearing Blvd., Toledo, O.

(a) Flat, drawn and formed hydrogen-furnace-brazed assemblies; of steel; in all sizes.
(b) Tractor frames, wheel guards, clutch housings, rocker arms, rocker shaft brackets, bomb fuses and adapters.
(c) Machining facilities.

Transue & Williams Steel Forging Corp., Alliance, O.

(a) Medium-sized stampings, blanked formed, pierced and drawn, from hot and cold rolled steel, stainless steel, aluminum and Monel metal.
(b) All sizes and types of parts.
(c) Welding, brazing, punching and riveting.

Troxel Mfg. Co., The, Elyria, Ohio.

(a) Flat, drawn and formed stampings of rolled steel, stainless steel, monel, brass, phosphor-bronze and copper; from .005 to .125 thick.
(b) To customers' specifications.
(c) Heat-treating and assembling facilities.

Truscon Steel Co., Pressed Steel Div., 6100 Truscon Ave., Cleveland.

(a) Pressed steel stampings.
(b) From 20-gage on refrigerator stampings to heavier ones used for automotive parts.
(c) None.

U, W

Union Spring & Mfg. Co., New Kensington, Pa.

(a) Flat and formed stampings of steel, spring steel and bronze; ½ x 1/32 in. metal up to 16 x ¼ in. for formed parts.
(b) Railway equipment, journal box lids, spring plates, etc.
(c) Complete facilities.

United-Carr Fastener Corp., 31 Ames St., Cambridge 42, Mass.

(a) Flat and drawn stampings of brass, cold-rolled steel, high-carbon steel, aluminum, monel, phosphor-bronze, etc.; in small sizes.
(b) Special nuts, etc.
(c) Assembling and machining facilities.

Wagner, E. R., Mfg. Co., 4611 N. 32nd St., Milwaukee 9.

(a) Small and medium, flat, formed and drawn stampings of steel, brass, aluminum and stainless steel; also hinges and joint spacers.
(b) Washing machine and refrigerator parts to customers' specifications.
(c) Assembling, heat-treating, welding and finishing facilities.

Wallace Barnes Co., Div. of Associated Spring Corp., Bristol, Conn.

(a) Flat and formed stampings of spring steel, stainless and alloys in small sizes.
(b) Various, to customers' specifications.
(c) Heat-treating facilities.

Weber Bros. Metal Works, 108 N. Jefferson St., Chicago 6.

(a) Flat, drawn and formed brass, copper and steel stampings, heaviest being No. 14 gage, 6-in. diam.
(b) All types of machine parts.
(c) Machining, assembling facilities.

Western Cartridge Co., East Alton, Ill.

(a) Stamped and drawn; of brass, bronze, phosphor bronze, nickel silver, sheets, strips, coils.
(b) To customers' specifications.
(c) Information not available.

Western Washer & Stamping Co., 2111 E. 51st St., Los Angeles.

(a) Flat and formed stampings of steel, brass, copper, aluminum and alclad metals; various sizes.
(b) To customers' specifications.
(c) Information not available.

Whitehead Stamping Co., 1691 W. Lafayette Blvd., Detroit 16.

(a) Light and medium stampings.
(b) SAE standard, U. S. standard, steel and brass washers.
(c) Complete facilities.

Williams, H. E., Products Co., 100-122 S. Main St., Carthage, Mo.

(a) Light stampings, sheet metal fabrication, steel and nonferrous metals, press size to 80 tons capacity.
(b) Automotive, electrical fluorescent light fixtures, etc.
(c) Turret lathes, screw machines, spot welders, plating, ovens for baking finishes.

Williams-Wallace Co., 160 Hooper St., San Francisco 7.

(a) Flat, formed, rolled, stamped, punched; 14 to 30 gage; of steel, copper, brass, aluminum.
(b) Ordnance metal parts and punchings.
(c) Welding and finishing facilities.

Woodworth Specialties Co., 239 Water St., Binghamton, N. Y.

(a) Flat, shallow drawn, formed and punched stampings of steel, copper, brass, nickel, monel, stainless steel, nickel silver, aluminum, etc., in sizes requiring presses to 40 tons capacity.
(b) Electric terminals, shallow cups and collars, disks, rings, ferrules, etc.
(c) Machining and assembling facilities.

Worcester Pressed Steel Co., 111 Barber Ave., Worcester, Mass.

(a) Pressed metal stampings of any metal or alloy from ½ in. to 4 ft. diam, in lengths to 7 ft, drawn to a depth of 21 in.; using material from .002 to ½ in. thick, cold forgings at 1500 tons pressure.
(b) Automotive, airplane, oil burner, office equipment, transmission parts, etc.
(c) Complete facilities.

See advertisement, Page 296

Worcester Stamped Metal Co. Inc., 9 Hunt St., Worcester, Mass.

(a) Light and heavy stampings of steel, brass, aluminum, copper and stainless steel, large and small.
(b) To customers' specifications.
(c) Annealing and hardening facilities.

Wrought Washer Mfg. Co., 2102 S. Bay St., Milwaukee.

(a) Stampings, blanking, forming, drawing, extruding, in all ferrous and nonferrous metals. Presses 300 tons capacity; material up to 1¼ in. thick.
(b) Washers, expansion plugs, automotive, etc.
(c) Complete facilities.

Forgings Producers

Reference letters beneath addresses of companies refer to: (a) Types, materials and sizes of forgings; (b) Names of forged machine parts customarily produced; and (c) Machining or heat-treating facilities.

A

Accurate Brass Co. Inc., 73rd Ave. and 88th St., Glendale, Brooklyn 27.
(a) Press forgings of brass to 10 lb, copper to 4 lb, and aluminum to 2 lb.
(b) Parts for all types of machines
(c) Machine facilities for brass forgings; aluminum forgings, heat treated.

Allegheny Ludlum Steel Corp., Brackenridge, Pa.
(a) Disks to 24 in. diam x 5 in. thick; also special shapes; of high-speed steels, alloy and carbon tool steels, stainless and Nitralloy.
(b) Hardened machine parts, etc.
(c) Complete facilities.
See advertisement, Page 157

Alliance Drop Forging Co., P. O. Box 427, Alliance, O.
(a) Small drop forgings.
(b) To customers' specifications.
(c) Treated and shot blasted, not machined.

Allis-Chalmers Mfg. Co., 1126 S. 70th St., Milwaukee 1.
(a) Hammered, drop and pressed forgings; billets and ingots of all types of steel; 40 in. in diam, 60 ft long and 40 tons in weight.
(b) Turbine, generator and propulsion shafts, engine parts, etc.
(c) Complete facilities.

Aluminum Company of America, Gulf Bldg., Pittsburgh.
(a) Aluminum and magnesium; any sizes.
(b) Largely aircraft and aircraft engine parts.
(c) Heat-treating facilities.
See advertisements, Pages 285, 313

American Brass Co., Waterbury, Conn.
(a) Hot-pressed copper, brass, bronze, nickel, silver, and special copper alloys in small sizes and shapes.
(b) To customers' specifications.
(c) None.
See advertisements, Pages 279-282

American-Forge Div., American Brake Shoe Co., 2621 S. Hoyne Ave., Chicago.
(a) Drop and upset forgings, of alloy and carbon steel.
(b) To customers' specifications.
(c) Complete heat-treating facilities.

American Forge Co., 735 Ashley Ave., Berkeley, Calif.
(a) Hammered and pressed forgings; carbon and alloy, to 75,000 lb max; drop forgings to 15 lb max in steel, carbon steel and stainless.
(b) Diesel engine and other machine parts.
(c) Normalizing and annealing.

American Hollow Boring Co., Erie, Pa.
(a) Hollow-bored forgings.
(b) Spindles, hydraulic cylinders, piston rods, clutch shafts, etc.
(c) Information not available.

American Magnesium Corp., 2210 Harvard Ave., Cleveland.
(a) Hammered and pressed forgings, of magnesium alloys, in any size.
(b) To customers' specifications.
(c) Heat-treating facilities.
See advertisement, Page 159

Ampco Metal Inc., 1745 S. 38th St., Milwaukee
(a) All practical sizes, in copper base alloys.
(b) Aircraft parts and engines, machine tool, heavy machinery and chemical equipment.
(c) Complete facilities.
See advertisement, Page 303

Atlas Drop Forge Co., 209 W. Mount Hope Ave., Lansing 2, Mich.
(a) Steel forgings from ½ lb to 250 lb.
(b) Farm implement, tractor, railroad, aviation, automotive, etc.
(c) Complete heat-treating facilities.

Atwater Mfg. Co., Plantsville, Conn.
(a) Drop and upset forgings of steel up to 20 lb.
(b) To customers' specifications.
(c) Heat treatment.

B

Baldt Anchor, Chain & Forge Co., Sixth & Butler Sts., Chester, Pa.
(a) Drop forgings of steel of any type in sizes from ½ to 300 lb.
(b) Marine anchors and chains.
(c) Complete facilities.

Benton Harbor Malleable Industries, Benton Harbor, Mich.
(a) Drop hammer steel forgings to 80 lb.
(b) To customers' specifications.
(c) Complete facilities.

Bethlehem Steel Co., Bethlehem, Pa.
(a) Open die forgings to 225,000 lb in all grades of carbon and alloy steels—solid and hollow. Drop forgings from 1 to 350 lb. Also upset forgings.
(b) Shafts, rotors, rolls, gears and other press and hammer forgings.
(c) Complete facilities.

Billings & Spencer Co., The, 1 Laurel St., Hartford 6, Conn.
(a) All types in brass, bronze, stainless steel, alloys, straight carbon steel, Monel metal and tool steel; to 100 lb.
(b) Airplane, automobile, machine tool parts, gas and diesel engine, conveyor, mining machinery, typewriter parts, etc.
(c) Complete facilities.

Bohn Aluminum & Brass Corp., 1400 Lafayette Bldg., Detroit, Mich.
(a) Hot-pressed brass and aluminum forgings to 15 lb in brass and to 10 lb in aluminum, depending upon the design.
(b) To customers' specifications.
(c) Heat-treating facilities.

Bonney Forge & Tool Works, Allentown, Pa.
(a) Drop forgings from 1 oz to 8 lb of any grade steel, alloy or carbon, also small upset forgings.
(b) Machine handles, etc.
(c) Complete facilities.

Brewer-Titchener Corp., 111 Port Watson St., Cortland, N. Y.
(a) Ferrous, drop and upset forgings to 28 lb.
(b) Automotive, aircraft transmission and custom drop forgings.
(c) Complete facilities.

Buckeye Forging Co., 10001 Harvard Ave., Cleveland.
(a) Small forgings of carbon and alloy steels, stainless steels, brass and copper.
(b) Automotive, tractor, tank, etc.
(c) Machining facilities.

Burke Steel Co., Inc., P. O. Box 514, Rochester 2, N. Y.
(a) Open hammer flat die forgings of all steels. Disks and rings, ½ x 4 in. to 12 x 30 in. Blocks, 5 to 1200 lb or up to 20 x 20 x 10 in. Bars in rounds, squares, hex or oct; 1½ to 12 in. Flats, 1 to 12 in. in width or thickness. Length, up to 12 ft annealed and 14 ft unannealed.
(b) Disks, rings, blocks, hubs, etc.
(c) Heat-treating facilities.

C

Cann & Saul Steel Co., 516 Commerce St., Philadelphia 6.
(a) Hammered and pressed, smooth forged or rough turned, steel (carbon, alloy and stainless) forgings of shafts or bars 18 in. in diam max (17,000 lb), rings 42 in. OD max, disks or hubs 33 OD max. (2000 lb).
(b) Shafts, bars, spindles, gear blanks, rings, ball races, etc.
(c) Heat-treating facilities.

Canton Drop Forging & Mfg. Co., Canton.
(a) Drop, upset, rolled and hammered forgings in steel only, to 600 lb.
(b) Parts for aircraft engines, propellers, planes, automotive cars and trucks.
(c) Complete heat treating.

Capewell Mfg. Co., 60 Governor St., Hartford, Conn.
(a) Drop and hand forgings in steel and nonferrous metals, 12 lb or less.
(b) Gears, levers, valves, or any part to specification.
(c) Complete heat-treating and cleaning facilities.

Carnegie-Illinois Steel Corp., 434 Fifth Ave., Pittsburgh.
(a) All type forgings produced with open dies, in all types of steel. Round—body diameter 68 in., max collar diam 90 in., max weight 220,000 lb. Rectangular—to 30 in. max thickness, 150 in. max width, with max weight of 220,000 lb. Hollow rounds—max OD 140 in.

(b) Axles, bars, bridge pins, hexagon shafts, propeller shafts, rotors, locomotive parts, back-up rolls, sleeves, pinions, reduction gears, mill housings, etc.
(c) Complete facilities.
See advertisement, Page 158

Carpenter Steel Co., The, 120 Bern St., Reading, Pa.
(a) Simple forgings made on flat dies in all SAE, stainless and tool steels to 3000 lb.
(b) Rings, disks, blocks, simple shafts, axles, etc.
(c) All heat-treating facilities; minimum of machine work.
See advertisements, Pages 286, 287

Champion Machine & Forging Co., 3695 E. 78 St., Cleveland.
(a) All type steel drop forgings to 3000 lb.
(b) To customers' specifications.
(c) Heat-treating facilities.

Chase Brass & Copper Co., Incorporated, 236 Grand St., Waterbury 91, Conn.
(a) Brass, naval brass, copper and copper alloy, and Olympic bronze.
(b) Automotive, aircraft, refrigeration parts, air valves, etc.
(c) Annealing, machining, polishing and plating facilities.

Clapp, E. D., Mfg. Co., 305 Genesee St., Auburn, N. Y.
(a) Drop forgings of carbon, alloy, tool, stainless steel, Monel, brass, bronze, copper, etc.
(b) Aircraft, automotive, railroad, tractor, etc.
(c) Complete facilities.

Cleveland City Forge Co., 4501 Lakeside Ave., Cleveland.
(a) Drop and upset forgings of carbon and alloy steel, from few ounces to several hundred pounds.
(b) To customers' specifications.
(c) Complete facilities.

Cleveland Hardware & Forging Co., 3270 E. 79th St., Cleveland.
(a) Drop and upset forgings in steel and brass.
(b) To customers' specifications.
(c) Complete facilities.

Clifford-Jacobs Forging Co., Box 330, Champaign, Ill.
(a) Drop forgings.
(b) Steel flanges, center plates, wedges, hubs, gears, connecting rods.
(c) Limited heat-treating.

Columbia Machine Works Inc., 255 Chestnut St., Brooklyn, N. Y.
(a) Hammered, drop, pressed, welded and upset forgings of carbon, alloy bars and billets. Drop forgings to 20 lb; hammered forgings to 300 lb.
(b) Shafts, shackles, rings, links, gears, pinions and railroad car parts.
(c) Machining facilities.

Columbus Anvil & Forging Co., The, 115 W. Frankfort St., Columbus 15, O.
(a) Hammered forgings of carbon and alloy steel. Rings, 36 in. in diam, shafts 12 in. in diam, gear blanks up to approx. 350 lb.
(b) King pins for road rollers, gear blanks for machines, crankshafts, etc.
(c) Heat-treating facilities.

Columbus Bolt Works Co., 291 Marconi Blvd., Columbus, O.
(a) Drop steel forgings, to 5 lb.
(b) To customers' specifications.
(c) Complete facilities.

Columbus Forge & Iron Co., The, 544 W. First Ave., Columbus, O.
(a) Steel alloy and plain carbon drop forgings; from ½ to 150 lb.
(b) Parts for automobiles, trucks, road and mining machinery, artillery, aircraft, tanks, etc.
(c) Semifinishing, normalizing and annealing.

Cornell Forge Co., 1659 W. 74th St., Chicago.
(a) All type drop forgings, from fraction of an ounce to 15 lb, carbon steel, Monel, stainless steel, etc.
(b) Cams, crankshafts, pins, gears, hubs, valves, connecting rods, and war products.
(c) Annealing and shot blasting.

Crucible Steel Co. of America, 405 Lexington Ave., New York.
(a) All types of forgings in carbon and alloy grades, to 40 tons max weight.
(b) Crankshafts, propeller shafts, piston rods, rams, gun forgings, rings, disks, etc.
(c) Complete facilities.

D

Davenport Besler Corp., 2305 Rockingham Rd., Davenport, Ia.
(a) Drop forgings and open steam hammer forgings.
(b) Crankshafts, connecting rods, levers, automotive and railway equipment.
(c) Complete facilities.

Dayton Forging & Heat Treating Co., The, 2323 E. First St., Dayton, O.
(a) Flat die forgings, smooth forged or rough machined, made of SAE steels, NAE steels, straight carbon steels in all sizes to 30 in. diam and 16 ft long on bars of 12 in. diam; and 6 ft long on bars of 16 in. diam.
(b) Collets, bars, shafts, gear blanks, rings, bushings, spindles, sleeves, studs, arbors, collars, etc.
(c) Complete facilities.

Delaware Alloy Forge Co., 2300 E. Tioga St., Philadelphia.
(a) Flat die steam hammer work in stainless steel, tool steel, Nitralloy, Monel metal, bronze and other alloys from 1 to 5000 lb.
(b) Seat rings for large valves, knitting machine cylinders, paper machinery shafts, and gears.
(c) Complete facilities.

Dow Chemical Co., The, Midland, Mich.
(a) Magnesium alloy forgings.
(b) To customers' specifications.
(c) Heat-treating facilities.

Dresser Mfg. Co., Fisher Ave., Bradford, Pa.
(a) Upset and hydraulic pressed steel forgings to 25 lb.
(b) Cone bushings, aircraft parts, bearing retainer rings, pipe coupling rings, etc.
(c) Machining facilities.
See advertisement, Page 306

Drop Dies & Forgings Co., 3097 E. 61st St., Cleveland.
(a) Drop forgings up to 25 lb.
(b) To customers' specifications.
(c) Heat-treating facilities.

Duff-Norton Mfg. Co., 2709 Preble Ave., N.S., Pittsburgh.
(a) Drop forgings of carbons, alloys, bronze and brass; from .10-.80, diam. not exceeding 9 in.
(b) To customers' specifications.
(c) Normalizing, annealing, heat treating.

Dyson, Joseph, & Sons, Inc., 5125 St. Clair Ave., Cleveland.
(a) Steel and aluminum hammered and hydraulic pressed forgings in 2 to 5000 lb.
(b) Shafts, die blocks, spindles, weldless rings, gear blanks, bars, etc.
(c) Complete facilities.

E. F

Ellwood City Forge Co., Box 590, Ellwood City, Pa.
(a) Steel forgings, 25 to 35,000 lb.
(b) Crankshafts for aircraft, automobile, gas steam, or diesel engines.
(c) Complete facilities.

Endicott Forging & Mfg. Co. Inc., Endicott, N. Y.
(a) Drop and upset forgings, of carbon and alloy steels, Monel, stainless, Nitralloy, brass, copper and bronze, from 2 oz to 80 lb.
(b) Gear blanks, crankshafts, connecting rods, rocker arms, etc.
(c) Heat-treating facilities.

Erie Forge Co., Erie, Pa.
(a) Flat die, press and hammered steel forgings.
(b) Marine, stationary engine crankshafts, etc.
(c) Complete facilities.

Falleen Drop Forge Co., Filer City, Manistee Co., Mich.
(a) Steam hammer and upset forgings in carbon and alloy steels, ½ to 45 lb.
(b) To customers' specifications.
(c) Heat-treating facilities.

Finkl, A., & Sons Co., 2011 N. Southport Ave., Chicago 14.
(a) Hammer and press forgings in carbon and alloy steels from 5 to 50,000 lb each.
(b) Shafts, rolls, rings, gear blanks, etc.
(c) Complete facilities.

Forging & Casting Corp., The, 1350 Jarvis Ave., Ferndale, Mich.
(a) Smooth hammered forgings, of SAE grades of steel, ½ lb to 1500 lb.
(b) Rings, blocks, disks, and irregular shapes.
(c) Annealing facilities.

Forgings & Stampings Inc., 23rd Ave. and Seventh St., Rockford, Ill.
(a) Drop forgings.
(b) To customers' specifications.
(c) Information not available.

G

Gardiner Mfg. Co., 2707 Union St., Oakland, Calif.
(a) Drop forgings to 12 lb and also hammer and upset forgings to 5 in. round or square.
(b) Gearshift levers, bolts, etc.
(c) Machining facilities.

General Drop Forge Div., Brown-Lipe Gear Co., 1738 Elmwood Ave., Buffalo.
(a) Drop-forged and upset forgings, of carbon, stainless, Monel and other alloys, 1 oz to 100 lb.
(b) Rings, gears, stem pinions, side gears, connecting rods, etc.
(c) Heat-treating and machinery.

General Metals Corp., Liberty & Homestead Rds., P.O. Box 198, Houston 1, Texas.
(a) Drop and open frame hammered forgings of all types of steel, brass and bronze in small to medium sizes, 1200 to 5000 lb hammer range.
(b) Automotive, aircraft, farm implements, etc.
(c) Complete facilities.

Globe Forge & Foundries Inc., Peat Street, Syracuse, N. Y.
(a) Drop and upset forgings in carbon and alloys from few ounces to 125 lb.
(b) Differential, transmission gears.
(c) Complete facilities.

Green Bay Drop Forge Co., 1341 S. State St., Green Bay, Wis.
(a) Drop forgings of steel; 10 lb max size.
(b) Aircraft and automotive parts.
(c) Complete facilities.

H

Hammond & Irving Inc., 254 North St., Auburn, N. Y.
(a) Steam hammer forgings in alloy and tool steels, stainless, Nitralloy and Monel metals, to 1200 lb.
(b) Weldless rings, gear blanks, shafts, hammered bars, etc.
(c) Complete facilities.

Harrisburg Steel Corp., 10th and Herr Sts., Harrisburg, Pa.
(a) Alloy and carbon open-hearth steel drop forgings which can be produced on steam drop hammers from 2000 to 8000 lb.
(b) All types of machine parts.
(c) Complete facilities.

Harris-Thomas Drop Forge Co., 126 Harshman St., Dayton, O.
(a) Drop forgings.
(b) To customers' specifications.
(c) Information not available.

Harvey Spring & Forging Co., 17th & Murray Sts., Racine, Wis.
(a) Carbon and alloys, steel drop-hammered forgings, ¼ to 10 lb.
(b) Agricultural machinery parts.
(c) Annealing furnaces.

Henry & Allen Inc., 2-36 Wadsworth St., Auburn, N. Y.
(a) Drop and hammered forgings of carbon and alloy steel, under 1 lb to 12 lb.
(b) Agricultural, automobile and commercial.
(c) Complete heat-treating facilities.

Heppenstall Co., 4622 Hatfield St., Pittsburgh. (Plants: Bridgeport, Conn., and Eddystone, Pa.)
(a) Forgings of carbon and alloy steels, to 45,000 lb rough turned weight.
(b) Shafts, crankshafts, die blocks, shear knives, rolls, etc.
(c) Complete facilities.

Herbrand Corp., Fremont, O.
(a) Drop forgings of all types of steel.
(b) Automobile, aircraft, truck, etc.
(c) Heat-treating facilities.

I, J

Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago.
(a) Pressed forgings in aluminum (1½ x 3 in.), and brass (1¾ x 4 in.).
(b) Aircraft, automotive and refrigeration parts.
(c) Complete facilities.

Indiana Forge & Machine Co., Indiana Harbor Station, East Chicago.
(a) Steel drop forgings to 4 lb.
(b) Clutch hubs.
(c) Annealing only; no machining.

Indianapolis Drop Forging Co., 1300 Madison Ave., Indianapolis 7.
(a) Hammered, drop and upset forgings in steel, copper and brass; hammered, up to 200 lb; drop and upset, up to 50 lb.
(b) To customers' specifications.
(c) Heat-treating facilities.

International Nickel Co., Inc., The, 67 Wall St., New York 5.
(a) Hammered forgings of monel, inconel, "K" monel and "Z" nickel.
(b) To customers' specifications.
(c) Complete facilities.
See advertisements, Pages 163, 250

Interstate Drop Forge Co., 4041 N. 27th St., Milwaukee.
(a) Drop and upset forgings of carbon, alloy and stainless steel.
(b) Levers, gears, segments, hydraulic fittings, connecting rods, crankshafts, etc.
(c) Heat-treating and magnetic inspection facilities.

Jersey Forging Works, 803 Jersey Ave., Jersey City, N. J.
(a) Alloy steel and standard SAE steel forgings.
(b) Gear blanks, rings, sleeves, rolls, shafts, spindles, etc.
(c) Complete facilities.

Johnson Forge & Machinery Co., Inc., A. Mishawaka, Ind.
(a) Drop, hammered and upset forgings of carbon alloy and stainless steel; 1½ to 40 lb. in size.
(b) Axle shaft, pinion gear, etc.
(c) Complete facilities.

Johnson Forging Works, 295-306 Thomas St., Newark 5, N. J.
(a) Hammered forgings of iron, steel and copper, to 2000 lb.
(b) Rings, gears, bars, dies, discs, crankshafts, shackles, truck springs, etc.
(c) Complete facilities.

Johnston & Jennings Co., 877 Addison Rd., Cleveland 14.
(a) Flat die forgings in plain carbon and alloy steels, 1 lb to 5 tons.
(b) Spindles, solid and hollow-bored; rings, arbors, shafts, gears, etc.
(c) Complete machine shop facilities.

K

Kelly Steel Works Inc., 5757 W. 65th St., Chicago 38.
(a) Upset and hammered forgings of all grades and types steel. Upset, ½ to 6 in. bar size; hammer, small to medium size.
(b) Universal joint forgings, quill shafts, gear blanks, bushings, bolts, welded assemblies and fabricated steel parts, threaded rods and turnbuckles, railroad parts, etc.
(c) Complete facilities.

Keystone Forging Co., Northumberland, Pa.
(a) Drop forgings of steel, brass and other alloys not exceeding 3 lb.
(b) To customers' specifications.
(c) Complete facilities.

Koppers Co., Bartlett Hayward Div., 200 Scott St., Baltimore, Md.
(a) D-H-S bronze and steel-hammered forgings up to 40 carbon in 2 to 8 in. rounds.
(b) To customers' specifications.
(c) Complete facilities.

Kortick Mfg. Co., 345 First St., San Francisco.
(a) Drop, press and upset forgings.
(b) Airplane, engine, tractor, and other miscellaneous or special parts.
(c) None.

Kraeuter & Co. Inc., 585 Eighteenth Ave., Newark 3, N. J. (Drop Forging Div., Nye Ave. and S. Twentieth St., Irvington 11, N. J.)
(a) Closed die and upset forgings, of Monel, bronze and carbon, stainless and alloy steels, ½ oz to 20 lb.
(b) To customers' specifications.
(c) Limited facilities.

Kropp Forge Co., 5301 W. Roosevelt Rd., Chicago.
(a) Steam hammer to 20 tons; drop and upset.
(b) To customers' specifications; merchant bars, die blocks, flanges.
(c) Machining, heat treating, Magnaflux inspection.

L

Ladish Drop Forge Co., Cudahy, Wis.
(a) Drop (up to 1000 lb), hammered (up to 4000 lb), and upset forgings of carbon and alloy steel.
(b) Aircraft, tractor, machine tool, flanges, rings, fittings, etc.
(c) Machining and heat treating.
See advertisement, Page 261

Lakeview Forge Co., Pittsburgh Ave., Erie, Pa.
(a) Drop forgings to 10 lb in alloy or carbon steel.
(b) To customers' specifications.
(c) Heat-treating facilities.

Lamson & Sessions Co., The, Cleveland, Kent, Chicago and Birmingham, Ala.
(a) Small hot and cold upset forgings of any metal or alloy.
(b) Bolts, nuts, cotters, capscrews and special hot and cold upset products.
(c) Complete facilities.

Lansing Drop Forge Co., Logan and Albert Sts., Lansing, Mich.
(a) Drop forgings to 40 lb coined, machined and heat-treated forgings, of all grades of carbon steel, Monel metal, aluminum and other alloys, from 2 oz to about 40 lb.
(b) Steering arms, shift levers, small crankshafts, camshafts, shock absorber arms, rocker arms, gears, housings, aircraft and ordnance parts, etc.
(c) Complete facilities.

Larson, Charles E., & Sons Inc., 2645-2665 N. Keeler Ave., Chicago 39.
(a) Large and small hammered forgings in iron and steel, high-carbon, high-chrome, high-speed, Monel and copper and other alloys.
(b) Miscellaneous parts.
(c) Complete facilities.

Latrobe Electric Steel Co., Latrobe, Pa.
(a) High-speed, carbon and alloy tool steel forgings, blocks and disks approx. 16 in. cube; flats approx. 20 x 10 in.
(b) Shear blades, disks, hobs, gear shaper forgings, cutter blanks, etc.
(c) Heat-treating facilities.

Laughlin, Thos., Co., The, 143 Fore St., Portland, Me.
(a) Drop forgings of rounds and flats steel, from 2 oz to 50 lb.
(b) Marine and industrial, wire rope and chain accessories.
(c) Machining, heat treating and galvanizing facilities.

Leard, William, Co. Inc., New Brighton, Pa.
(a) Hammered and hydraulic pressed steel forgings to 45,000 lb.
(b) Crankshafts, connecting rods and other type forged steel shafts.
(c) Complete facilities.

Letts Drop Forge Inc., 2714 W. Jefferson Ave., Detroit.
(a) Small and medium drop forgings in carbon and alloy bar stock.
(b) Automotive, aircraft, ordnance and maritime.
(c) None.

Lindell Drop Forge Co., S. Logan and N. Y. C. R. R., Lansing, Mich.
(a) Carbon and alloy steel forgings, from 1 oz to 15 lb.
(b) For automotive, agricultural, mining machinery, etc.
(c) None.

M

Machinery Forging Co., The, 5450 Hamilton Ave., Cleveland.
(a) Flat die forgings of carbon and alloy steels, 1-2000 lb.

(b) Rings, disks, blocks, spindles, bars, hubs, etc.
(c) Rough turning only.

Maine Steel, Inc., 80 Second St., South Portland 7, Me.
(a) Drop, upset and trip hammer forgings in carbon and alloy steel and bronze; to 150 lb in closed dies. Larger in open dies.
(b) Marine and industrial parts, elevator fittings, etc.
(c) Complete facilities.

Manganese Steel Forge Co., Richmond St. & Castor Ave., Philadelphia.
(a) Upset and pressed forgings in 11-14 per cent manganese steel to 50 lb.
(b) Headed pins.
(c) Complete facilities.

McKaig-Hatch Inc., 125 Skillen St., Buffalo 7.
(a) Drop and upset forgings in carbon, alloy, stainless steel, aluminum, bronze, brass, copper, nickel and magnesium; 3 oz to 15 lb depending upon the shape.
(b) Automotive and other parts to customers' specifications.
(c) Complete facilities.

Melling Forging Co., 1401 Case St., Lansing, Mich.
(a) Steel drop forgings; from 1 oz to 8 lb.
(b) To customers' specifications.
(c) Complete facilities.

Merrill Brothers, 56 Arnold Ave., Maspeth, Queens, N. Y.
(a) Drop forgings of steel and alloys, from fraction of oz to 100 lb or more.
(b) Turnbuckles, clevis nuts, shackles, eyebolts, hexagon sleeve nuts, etc.
(c) Information not available.

Mesta Machine Co., Box 1466, Pittsburgh.
(a) Very large steel and alloy steel forgings, both hollow and solid.
(b) Shafts, pinions, rolls, high pressure cylinders and reaction vessels.
(c) Complete facilities.

Michigan Forging Co., 4000 W. Jefferson, Detroit 9.
(a) Drop forgings of steel from 1 to 10 lb in size.
(b) Miscellaneous machine parts.
(c) None.

Midvale Co., The, Nicetown, Philadelphia.
(a) Press or hammer forgings, solid or hollow, in carbon or alloy steels.
(b) Rings for mining and cement machinery, flanges, gears, shafting, turbine bucket wheels, high-pressure vessels, crankshafts for steam and internal combustion engines, etc.
(c) Complete facilities.

Milwaukee Forge & Machine Co., 1532 E. Oklahoma Ave., Milwaukee 7, Wis.
(a) Open-frame and drop-hammered forgings and weldless rolled steel rings in carbon and alloy steel, any size.
(b) Crankshafts, hub forgings, axles and weldless (seamless) rolled rings.
(c) Complete facilities.

Mitchell Steel Co., The, Stockyards Station, Cincinnati.
(a) Steam hammer forgings in plain carbon alloy and stainless steel.
(b) All types of machine parts, railroad, marine, etc.
(c) Complete facilities.

Moline Forge Inc., 4101 Fourth Ave., Moline, Ill.
(a) Dropped and pressed forgings of heat-resistant steel, carbon and alloys, within capacity of 2500 and 3000 lb board drop hammer; pressed forgings for presses to 300 tons.
(b) For oil field, small diesel engine, automotive, agricultural equipment parts, etc.
(c) Hardening and drawing furnaces.

Mondie Forge Co. Inc., 10300 Berea Rd., Cleveland.
(a) Drop forgings to 75 lb, upset forgings to 4 m., also coining.
(b) Gear blanks and other parts to customers' specifications.
(c) Information not available.

Moore Drop Forging Co., 36 Walter St., Springfield, Mass.
(a) Drop, upset and coined forgings.
(b) To customers' specifications.
(c) Heat treating and machining.

Mueller Brass Co., 1925 Lapeer Ave., Port Huron, Mich.
(a) Drop hammered and pressed forgings of brass, bronze, copper, aluminum and alloys; 1 oz to 25 lb.
(b) To customers' specifications.
(c) Complete facilities.

N, O

National Forge & Ordnance Co., Irvine, Warren County, Pa.
(a) Hammered and pressed steel forgings.
(b) Rough or finished parts.
(c) Complete machining facilities.

National Lock Washer Co., 40 Hermon St., Newark 5, N. J.
(a) Small drop forgings.
(b) Steel rod ends in adjustable yoke, plain yoke and eye types; steel clevis pins for steel rod ends; steel plugs, rings and flanges; all in standard sizes. Also various custom forgings to order.
(c) Heat treating and machining.

Octigan Forge & Mfg. Co., 2428 S. Lowe Ave., Chicago.
(a) Drop forgings.
(b) To customers' specifications.
(c) None.

Ohio Forge & Machine Corp., 3010 Woodhill Rd., Cleveland.
(a) Drop, upset and flat hammer steel forgings in all sizes.
(b) All types of precision gears, spline shafts, power transmitting equipment.
(c) Complete heat-treating. Machining for gears and shafts only.

Oliver Iron & Steel Corp., N. E. Corner S. 10th and Muriel Sts., Pittsburgh.
(a) Small drop and upset forgings, rough or machined, in carbon or alloy steels, in sizes to 8 in. in diam, and 15 lb in wt.
(b) Bolts, nuts, screws, rivets and either hot or cold-headed special parts.
(c) Complete facilities.

Owensboro Forging Co., Owensboro, Ky.
(a) Small drop forgings.
(b) To customers' specifications.
(c) None.

P

Pacific Car & Foundry Co., Renton, Washington.
(a) Hammered, drop and upset forgings of steel; to 8 in.
(b) Gears, pistons, connecting links, etc.
(c) Complete facilities.

Park Drop Forge Co., The, 777 E. 79th St., Cleveland.
(a) All types of drop steel forgings to 4000 lb.
(b) Crankshafts, connecting rods, camshafts, axles, gears, etc.
(c) Complete machining, heat treating.

Pettibone Mulliken Corp., 4710 W. Division St., Chicago.
(a) Drop, upset and hammer forgings in alloy and carbon steels; drop, to 25 lb, upset to 5 in. in diam.
(b) Automotive, agricultural, aircraft, railroad parts, etc.
(c) Machining and heat-treating.

Philadelphia Hardware & Malleable Iron Works, 7500 State Rd., Philadelphia.
(a) Drop steel forgings not over 30 lb nor more than 9 in. diam or 18 in. long.
(b) Turnbuckles, eyebolts, etc.
(c) Drilling and tapping.

Phoenix Mfg. Co., Front & Chapel Sts., Catasaqua, Pa.
(a) Drop forgings to 40 in.
(b) Journals, yokes, welding flanges, clevises, also commercial forgings of various types and designs.
(c) Machining facilities.
See advertisement, Page 156

Pittsburgh Forgings Co., Riverside Div., Jackson, Mich.
(a) Drop forgings, from 3 to 70 lb.
(b) Specialty, automotive hubs, gears, flanges, tractor wheels and various round hammer upset forgings.
(c) Complete facilities.

Pittsburgh Forgings Co., Thorne street, Coraopolis, Pa.
(a) Drop and upset forgings of carbon, alloy and stainless steel, from 1 oz to 200 lb.
(b) Automotive, farm equipment, tractor, railroad, etc.
(c) Milling, drilling, tapping; full heat treating.

Pittsburgh Trolley & Forge Co., 117 Water St., Pittsburgh.
(a) Forgings in carbon and alloy steels, to 2000 lb.
(b) Spindles, shafts, gears, rings, etc.
(c) Complete facilities.

Poor & Co., Canton Forge & Axle Works, 2027 Dueber Ave., S. W., Canton, O.
(a) Drop die and upset forgings in carbon and alloy steels, 1 to 350 lb.
(b) Spindles, levers, gears, etc.
(c) Heat-treating facilities.

Porter Forge & Furnace Inc., 6 Ashland St., Everett, Mass.
(a) Drop forgings of standard and special steels and metals.
(b) To customers' specifications.
(c) Complete heat-treating facilities.

Portland Forge & Fdry. Co., Portland, Ind.
(a) Board hammer, upset forgings of steel bars, to 60 lb.
(b) Gears, etc.
(c) Complete facilities.

R

Revere Copper & Brass Inc., 230 Park Ave., New York, 7.
(a) Die pressed and hammered forgings, of brass, bronze, copper, nickel silver, cupronickel, silicon bronze (Herculoy), aluminum and magnesium.
(b) To customers' specifications.
(c) Complete facilities.

Rhode Island Tool Co., 148 W. River St., Providence, R. I.
(a) Drop forgings of carbon, alloy and stainless steels, 10 in. diam, 1½ in. thick; 2 in. diam, 18 in. long.
(b) Bolts and nuts and screw machine products.
(c) Heat-treating facilities.

Rockford Drop Forge Co., 1033 Ninth St., Rockford, Ill.
(a) Drop forgings.
(b) Automotive and industrial clutches, etc.
(c) Information not available.

Rome Mfg. Co. Div., Revere Copper & Brass Inc., Railroad St., Rome, N. Y.
(a) Hot-pressed forgings in brass, copper and related alloys; aluminum and magnesium.
(b) To customers' specifications.
(c) Complete facilities.

S

St. Pierre Chain Corp., 50 Frank St., Worcester, Mass.
(a) All types of forgings of alloys, soft steels, etc., 1 oz to 50 lb.
(b) Automobile, airplane and other machine parts.
(c) Complete facilities.

Salem Tool Co., The, 767 S. Ellsworth Ave., Salem, Ohio.
(a) Hammer and pressed forgings of carbon steel, made of 1½ in. square steel and smaller.
(b) Mining tools.
(c) Machining and limited heat treating facilities.

Scovill Mfg. Co., Waterbury, Conn.
(a) Made-to-order forgings from brass, bronze, copper and aluminum.
(b) To customers' specifications.
(c) Complete facilities.

Shuler Axle Co. Inc., 2901 S. Second St., Louisville, Ky.
(a) All type forgings in carbon and alloy steel, 1 to 300 lb.
(b) Automotive and trailer axles, also heavy-duty two-shoe brakes.
(c) Complete facilities.

Shunk Mfg. Co., Auto Ave., Bucyrus, Ohio.
(a) Hammered and pressed steel forgings of small types.
(b) To customers' specifications.
(c) Complete facilities.

Smith-Armstrong Forge, Inc., 1209 Marquette Rd., Cleveland.
(a) Hammered iron and steel forgings from 2 lb. to 2000 lb.
(b) Gears, rings, shafting, camshafts, spindles, bars, flats, rounds and shaped work, etc.
(c) Complete facilities.

Snell Mfg. Co., Fiskdale, Mass. (factory); 149 Washington St., Worcester, Mass. (office).
(a) Hammered and drop, carbon and alloy steel forgings, ¼ to 1½ lb.
(b) Ship augers, gun parts, etc.
(c) Heat-treating facilities.

Southern Saw Works Inc., East Point Rd., Atlanta, Ga.
(a) Drop hammer forgings in carbon and alloy steels to approximately ½ lb. depending on design and shape.
(b) Bits and shanks for inserted tooth saws, wrenches, commercial per specifications.
(c) Heat-treating facilities.

Spencer Mfg. Co., Spencer, O.
(a) Rolled and upset forgings.
(b) Axle forgings, industrial shafts, etc.
(c) Complete facilities.

Standard Steel Works Div., Baldwin Locomotive Works, Burnham, Mifflin Co., Pa.
(a) Hammered and pressed forgings, of carbon and alloy ingots and blooms; min wt 35 lb; max wt 50,000 lb; max forged diam 44 in.
(b) Locomotive forgings such as axles, crank pins, piston rods, connecting rods, etc.; also industrial and marine forgings such as shafting, pinions, spindles, blocks, etc.
(c) Heat-treating facilities.

Steel, R., & Sons Inc., 4221 Ninth St., Long Island City 1.
(a) Carbon and alloy steel hammered forgings in 10 in. square or round, and under.
(b) Various.
(c) None.

Steel Improvement & Forge Co., 970 E. 64th St., Cleveland.
(a) Drop hammer, upset and press forging.
(b) Machine tool, aircraft, automotive, truck and tractor, marine and coal industries.
(c) Complete facilities.
See advertisement, Page 283

Storms Drop Forging Co., P. O. Box 2050, Springfield, Mass.
(a) Drop forgings, from fraction of ounce to 50 lb. in all grades of forgeable materials; also hot-pressed brass forgings.
(b) To customers' specifications.
(c) Complete heat treating facilities.

T

Taylor Forge & Pipe Works, P. O. Box 485, Chicago.
(a) Drop, upset and hammer forgings of carbon and alloy steels, some nonferrous metals, to 114 in. OD.
(b) Flanges, rings, nozzles, necks, gear blanks, etc.
(c) Complete facilities.
See advertisement, Page 314

Taylor-Wharton Iron & Steel Co., (Easton, Pa. plant), High Bridge, N. J.
(a) Pierced and drawn forgings to 13 in. in diam., specializing in high-pressure gas cylinders.
(b) To customers' specifications.
(c) Complete facilities.

Transue & Williams Steel Forging Corp., Alliance, O.
(a) All sizes and types of drop forgings from 1 oz to 1000 lb of carbon steels, alloys and nonferrous metals.
(b) Various sizes and types of connecting rods, crankshafts, camshafts, bearing caps, driveshafts and gears.
(c) Complete heat treating.

Tube Turns, Inc., 224 E. Broadway, Louisville 1, Ky.
(a) Upset and press forgings of steel and aluminum; upsetters in all sizes, presses up to 4000 tons.
(b) Radial and liquid-cooled aircraft, marine, tank and diesel engine parts, tank, truck and various forgings of other types.
(c) Complete facilities.

U, V, W

Union Forging Co., Endicott, N. Y.
(a) Drop and press forgings.
(b) Automotive parts.
(c) Heat-treating facilities.

Unit Drop Forge, Div. of Fuller Mfg. Co., 1903 South 62nd St., West Allis, Wis.
(a) Hammered, drop and upset steel and bronze forgings, 1 to 400 lb.
(b) Transmission countershaft gears.
(c) Heat-treatng facilities.

Vichek Tool Co., 3001 E. 87th St., Cleveland.
(a) Drop steel forgings, to 3 lb.
(b) To customers' specifications.
(c) Complete machine shop, automatic furnace.

Vulcan Steam Forging Co., 223-257 Rano St., Buffalo, N. Y.
(a) Open die forgings of carbon, alloy, tool and stainless steels, and nonferrous metals.
(b) Gear blanks, crankshafts, piston rods, levers, spindles, rolls, weldless rings, shaped work.
(c) Complete facilities.

Wilcox, D., Mfg. Co., N. Chestnut & E. Allen Sts., Mechanicsburg, Pa.
(a) Drop forgings of alloy and carbon steel, 1 oz to 30 lb.
(b) Automotive, railroad, farm and marine equipment, pump parts, pipe flanges, gears, connecting rods, crankshafts, shackles, clamps, bolts, etc.
(c) Heat-treating facilities.

Williams, J. H., & Co., 400 Vulcan St., Buffalo.
(a) Drop forgings in steel and nonferrous metal from ½ oz to 100 lb.
(b) Structural forged parts, gears, levers, cams, cranks, etc., for machine tools, gas engines, compressors, aircraft, automotive, etc.
(c) Complete facilities.
See advertisement, Page 308

Wyman-Gordon Co., Worcester, Mass., and Harvey, Ill.
(a) Drop hammer, upset and press forgings in steel and aluminum from 10 to 500 lb.
(b) Automotive and aviation.
(c) Heat-treating facilities.

Machine Die Castings Producers

Reference letters beneath addresses of companies refer to: (a) Types, materials and sizes of die castings; (b) Names of die-cast parts customarily produced; and (c) Machining, finishing and assembling facilities.

A

AC Spark Plug Div., General Motors Corp., 1300 N. Dort Highway, Flint, Mich.
(a) Zinc base and aluminum base die castings, from small speedometer parts to castings 26 x 20 in.
(b) Automotive and aircraft parts.
(c) Complete facilities.

Advance Pressure Castings Inc., 34 N. 15th St., Brooklyn 22, N. Y.
(a) Aluminum, zinc, copper, silicon and magnesium; aluminum 3 lb max and zinc 8 lb max.
(b) Parts for aircraft and Army Signal Corps.
(c) Machining facilities.
See advertisement, Page 300

Aluminum Co. of America, 634 Gulf Bldg., Pittsburgh.
(a) Aluminum alloy and zinc die castings, all types and sizes.
(b) To customers' specifications.
(c) Complete finishing facilities.
See advertisements, Pages 285, 313

The American Brass Co., Waterbury 88, Conn.
(a) Alloy 624 and Alloy 1026; max wt 3 to 3½ lb, in any shape within a 6-in. dia. circle, or a piece approx. 9 in. long.
(b) Electrical, radio, aircraft, etc.
(c) None.
See advertisements, Pages 279-282

American Magnesium Corp., 2210 Harvard Ave., Cleveland.
(a) Low and high pressure die castings of various magnesium alloys, in any size.
(b) To customers' specifications.
(c) Light machining.
See advertisement, Page 159

Aurora Metal Co., 614 W. Park Ave., Aurora, Ill.
(a) Aluminum bronze and silicon bronze die castings.
(b) To customers' specifications; including such parts as automotive, farm equipment, machine tool, etc.
(c) Information not available.

B

Badger Die Casting Co., 1570 S. First St., Milwaukee 4.
(a) Zinc and aluminum alloy die castings, from very small to 10 lb in zinc and 5 lb in aluminum.
(b) Aircraft instrument parts, small gasoline engine parts, carburetors and other parts.
(c) Complete facilities.

Benton Harbor Malleable Industries, Benton Harbor, Mich.
(a) Special high-grade zinc die castings, not to exceed 5 lb.
(b) To customers' specifications.
(c) Machining.

Borman Castings Corp., St. Joseph, Mich.
(a) Zinc, aluminum, magnesium and lead die castings in sizes corresponding to a 6-lb zinc casting.
(b) Washing machine, automotive and aircraft parts.
(c) Limited facilities.

C

Chicago Die Casting Mfg. Co., 2510-14 W. Monroe St., Chicago.
(a) Zinc base alloy die castings in sizes of 14 x 12 x 4 in.
(b) All types of machine parts.
(c) Complete facilities.

Cincinnati Die Casting Co., 2117 Spring Grove Ave., Cincinnati.
(a) Zinc, aluminum and brass die castings; 10 lb in zinc, 8 lb in aluminum and ½ lb in brass.
(b) Aircraft and ordnance parts.
(c) Machining and finishing facilities.

Congress Die Castings Div., 3750 E. Outer Drive, Detroit.
(a) Zinc alloy die castings, to 10 lb; also aluminum.
(b) Pulleys, flexible couplings, vending machine, washing machine, radio, woodworking machine and automotive parts.
(c) Complete facilities.

D

Dayton Die Casting Co., 111 Front St., Dayton 2, O.
(a) Aluminum, brass, zinc and lead die castings; 3 lb in aluminum and approx. 2 lb each in other alloys.
(b) All types of machine parts.
(c) Complete facilities.

Doehler Die Casting Co., 386 Fourth Ave., New York. (Plants at Chicago, Batavia, N. Y., Toledo, Ohio and Pottstown, Pa.)
(a) Zinc, aluminum, brass, bronze, tin, lead and magnesium die castings.
(b) All types of machine parts.
(c) Machining and finishing facilities.

Dollin Corp., 610 S. 21st St., Irvington 11, N. J.
(a) All sizes, in aluminum and zinc alloys.
(b) All types of die-cast parts.
(c) Machining and trimming facilities; cold chamber, high-pressure and other high speed and special equipment.

Dow Chemical Co., The, Midland, Mich.
(a) Dowmetal, magnesium alloy, die castings.
(b) All types of automotive, aircraft and other machine parts.
(c) None.

E. F

Electric Auto-Lite Co., Die Casting Div., Woodstock, Ill.
(a) Zinc and aluminum die castings, in sizes approx. 18 x 24 x 6 in. max.
(b) Brackets, covers, housings, bases, gears, motor parts, trim, etc.
(c) Machining and finishing facilities.

Federal Die Casting Co., 2222-32 Elston Ave., Chicago 14.
(a) Zinc and aluminum die castings, 16 lb in zinc and 3 lb in aluminum (cold chamber).
(b) Parts for radios, automobiles, stokers, airplanes, etc.
(c) Complete facilities.

Federal-Mogul Corp., 11031 Shoemaker Ave., Detroit.
(a) Tin and lead base, medium and small die castings.
(b) Primary bearings and bushings.
(c) Complete facilities.

H

Harvill Corp., 6251 W. Century Blvd., Los Angeles 43.
(a) Aluminum, magnesium, manganese-bronze and zinc alloy die castings, up to approximately 16 x 24 in and 8 lb in weight.
(b) All types of machine parts.
(c) Machining.

Heick Die Casting Corp., 4061 Schubert Ave., Chicago.
(a) Aluminum and zinc alloy die castings, from ½ oz to 4 lb.
(b) Brackets, pulleys, levers, frames, etc.
(c) Complete assembling and machining facilities.

Hoover Co., The, Maple and McKinley Sts., North Canton, O.
(a) Aluminum and zinc die castings, to 24 in square.
(b) To customers' specifications.
(c) Complete facilities.

K, L

Krone Die Casting Co., Paul, 3005 W. Carroll Ave., Chicago 12.
(a) Zinc and aluminum alloy die castings; zinc to 5½ lb and aluminum to 2 lb.
(b) All types of machine parts.
(c) Machining facilities.

Latrobe Die Casting Co., North and Unity Sts., Latrobe, Pa.
(a) Zinc, aluminum, tin and lead alloy die castings; aluminum, 5 lb; zinc, 8 lb; tin and lead, 2 lb.
(b) All types in weight range.
(c) Machining and finishing facilities; production under X-ray and laboratory control.

M

Madison-Kipp Corp., 210 Waubesa St., Madison, Wis.
(a) Zinc and aluminum die castings, all sizes.
(b) Automotive, household appliance, railway, ordnance parts, etc.
(c) Complete facilities.
See advertisement, Page 146

Mason, L. E., Co., 98 Business St., Hyde Park 36, Mass.
(a) Magnesium, aluminum and zinc castings.
(b) Large, to customers' specifications.
(c) Complete facilities.

McGill Mfg. Co., Metal Div., Valparaiso, Ind.
(a) Aluminum, bronze and special hard bronze die castings, from ½ oz to 10 lb. Hydraulic pressure castings of hard yellow brass and silicon bronze, ½ oz to 2 lb.
(b) Great variety of machine parts including gears, levers, and other corrosion-resistant machine parts.
(c) Complete facilities.

Michigan Die Casting Co., 8651 E. 7 Mile Rd., Detroit 12.
(a) Zinc and aluminum die castings; to 25 lb in zinc, and 10 lb in aluminum.
(b) Automotive and aircraft parts.
(c) Complete facilities.

Milwaukee Die Casting Co., 1015 N. Fourth St., Milwaukee 3.
(a) Zinc to 5 lb; aluminum to 4 lb; lead, tin to 14 lb.
(b) Motor cases, electrical apparatus, ordnance, aircraft, bomb parts, fuses, etc.
(c) Machining and finishing facilities.

Monarch Aluminum Mfg. Co., Dycast Products Div., 9301 Detroit Ave., Cleveland.
(a) Zinc and aluminum base alloy die castings; in zinc to approx. 15 lb, in aluminum, approx. 5 lb.
(b) Automotive, radio, refrigeration, electrical, cases, vending machine, etc.
(c) Machining and assembling facilities.

Mt. Vernon Die Casting Corp., 118 Pearl St., Mount Vernon, N. Y.
(a) Aluminum and zinc; up to 18 lb in zinc, and 10 lb in aluminum.
(b) Machine parts.
(c) Machining facilities.

N

National Lock Co., 1902 Seventh St., Rockford, Ill.
(a) Zinc die castings to 12 in.
(b) To customers' specifications.
(c) Complete facilities.

New Products Corp., 448 North Shore Drive, Benton Harbor, Mich.
(a) Aluminum, brass, magnesium and zinc die castings; up to 5 lb in aluminum; 1 lb in brass; 15 lb in zinc; and 2 lb in magnesium.
(b) Airplane carburetor parts, rotary pump assemblies, fuse parts, airplane air-speed indicators, etc.
(c) Complete facilities.

Newton-New Haven Co., New Haven 4, Conn.
(a) Aluminum, magnesium and zinc alloy die castings, up to medium-large.
(b) Aircraft instrument parts.
(c) Complete facilities.

P

Parker White Metal & Machine Co., McKinley Ave., at 23rd St., Erie, Pa.
(a) Zinc and aluminum base die castings in any size.
(b) All types of machine parts.
(c) Complete facilities.

Phoenix Die Casting Co., 21 Illinois St., Buffalo.
(a) Aluminum, lead, tin and zinc-base alloy die castings; no extra large sizes.
(b) To customers' specifications.
(c) None.

Precision Castings Co., Inc., Fayetteville, N. Y. (Branch, Cleveland, O.; Die Shop, Syracuse, N. Y.)
(a) Aluminum, magnesium and zinc castings from fraction of ounce to 26 lb.
(b) Automotive, household appliances, outboard motors, etc., and to customers' specifications.
(c) Machining, assembling facilities.

Pressure Castings Inc., 21500 St. Clair Ave., Cleveland.
(a) Zinc and aluminum alloy die castings to 24 x 24 in.
(b) To customers' specifications.
(c) Finishing and machining facilities.

S, T

Schultz Die Casting Co., 1810 Clinton St., Toledo, O.
(a) Zinc base die castings.
(b) Automotive, etc.
(c) Machining and finishing facilities.

Sterling Die Casting Co., 743 39th St., Brooklyn 32, N. Y.
(a) All sizes of zinc and aluminum die castings.
(b) All types of machine parts.
(c) Machining facilities.

Superior Die Casting Co., 17325 Euclid Ave., Cleveland.
(a) Zinc and aluminum alloy die castings.
(b) Ordnance, aircraft and various machine parts.
(c) Information not available.

Titan Metal Mfg. Co., Bellefonte, Pa.
(a) Brass and bronze die castings.
(b) Electrical, refrigeration and miscellaneous parts.
(c) Machining and assembling.

Toman, E., & Co., 2621 W. 21st place, Chicago 8.
(a) All types of zinc base die castings from ½ oz to 8 lb.
(b) To customers' specifications.
(c) Complete facilities.

W, Y

Warner Mfg. Co., 666 Hawthorne St., Glendale 4, Calif.
(a) Aluminum, manganese-bronze and magnesium die castings; up to 3 lb in aluminum and 5 lb in manganese bronze.
(b) Aircraft and bomb parts.
(c) Facilities for all the above.

Western Die Casting Co., 4065 Hollis St., Emeryville 8, Calif.
(a) Aluminum, magnesium, manganese-bronze, zinc and lead die castings in all sizes; up to 20 lb in zinc.
(b) Aircraft parts.
(c) Complete facilities.

Yale & Towne Mfg. Co., The, 200 Henry St., Stamford, Conn.
(a) Zinc base alloy No. 3 die castings; small and medium, to approx. 3 x 5 in.
(b) Rim latches, automotive locks, etc.
(c) Finishing and assembling facilities.

Custom Molders of Plastics

Reference letters beneath addresses of companies refer to: (a) Types of materials utilized; and (b) Names of machine parts customarily molded.

A

Accurate Molding Corp., 116 Nassau St., Brooklyn 1, N. Y.

(a) BAKELITE, DUREZ, RESINOX, BEETLE and PLASKON.

(b) Terminal blocks, electrical control boxes, terminal plates, motor replacement switches, cable connectors, instrument housing, commutators, etc.

Ackerman Plastic Molding, 986 E. 200th St., Cleveland.

(a) BAKELITE, DUREZ, BEETLE, PLASKON, TENITE and THIOKOL.

(b) Mechanical, electrical and industrial parts.

Advance Molding Corp., 54 W. 21st St., New York.

(a) TENITE I and II, LUCITE, cellulose acetate, and other thermoplastics.

(b) All custom molded injection parts.

All American Aircraft Products Inc., 1350 E. Anaheim, Long Beach, Calif.

(a) All types of materials.

(b) Aircraft control pulleys, drums, fittings, etc.

Allied Plastics Co., 5225 Wilshire Blvd., Los Angeles.

(a) Cellulose acetates, cellulose acetate butyrates, polystyrenes, methyl methacrylate, vinylidene, chloride and all other thermoplastics.

(b) Injection molded pieces, also extruded.

American Insulator Corp., New Freedom, Pa.

(a) BAKELITE, DUREZ, RESINOX, PLASKON, BEETLE, LUMARITH, TENITE, PLASTACELE, POLYSTYRENE, LUCITE, VINYLITE, ETHOCEL, and cold-molded composition.

(b) To customers' specifications.

American Molding Co., 355 Fremont St., San Francisco 5.

(a) BAKELITE, DUREZ, BEETLE, PLASKON, TENITE, LUMARITH, RESINOX, FIBESTOS, CRYSTALITE, PLASTACELE, LUCITE, POLYSTYRENE and ETHOCEL.

(b) Technical, automotive, electrical, aircraft, etc. Compression, injection, and extrusion molded parts.

American Phenolic Corp., 1830 S. 54th Ave., Chicago 50.

(a) BAKELITE, DUREZ, AMPHENOL, SUNEX, and transparent POLYSTYRENE.

(b) Electrical small sections, special rods and tubes, electrical connectors, etc., for aircraft and radio.

American Plastics Corp., 225 W. 34th St., New York.

(a) TENITE, FIBESTOS, LUMARITH, PLASTACELE, LUCITE, etc.

(b) Extruded shapes, ribbons, tubes, rods, etc.

American Products Mfg. Co., Oleander cor. Dublin Sts., New Orleans 18.

(a) Cellulose acetates, ethyl cellulose, and aceto-butyrates.

(b) Cover shields.

Amos Molded Plastics Div., Amos-Thompson Corp., Edinburg, Ind.

(a) SARAN, ETHOCEL Acetate, TENITE II, POLYSTYRENE, LUCITE and CRYSTALITE.

(b) Nozzles, couplings, handles, knobs, pushbutton lenses, etc.

Anchor Plastics Co., 533-541 Canal St., New York 13.

(a) VINYLITE, LUCITE, PLEXIGLAS, cellulose esters and ethyl cellulose are extruded.

(b) To customers' specifications.

Armstrong Cork Co., Industrial Div., Lancaster, Pa.

(a) Cork compositions, cork-and-synthetic-rubber compositions, synthetic rubber compounds, cork-and-rubber compositions, rag felt papers, fibrated leather, and other fiber sheet packing materials.

(b) Gaskets, oil-retaining rings, washers, valve disks, friction wheels, strips, blocks, disks, ribbon, polishing wheels, handles, roll coverings, packings, seals, feed rolls, friction grips, bushings diaphragms, anti-skid parts, glazing strip, vibration-damping pads, etc.

See advertisement, Page 258

Atlantic Plastics, 2730 Grand Ave., Cleveland.

(a) BAKELITE, BEETLE, PLASKON, DUREZ, RESINOX, TENITE, LUCITE, PLASTACELE, LUMARITH, THIOKOL and other synthetics.

(b) Safety supply parts, lighting and electrical, radio, chemical, mechanical, etc.

Auburn Button Works Inc., Auburn, N. Y.

(a) All kinds of plastic materials.

(b) All types of industrial parts.

B

Bachmann Bros. Inc., 1420-38 E. Erie Ave., Philadelphia.

(a) All thermoplastics except SARAN.

(b) Radio, medical parts, etc.

Berkander Inc., George F., 891 Broad St., Providence, R. I.

(a) TENITE, LUMARITH and PLASTACELE.

(b) To customers' specifications.

Boonton Molding Co., 326 Myrtle Ave., Boonton, N. J.

(a) All kinds of plastic molding materials.

(b) Parts molded by all methods to customers' specifications.

Breeze Corporations, Inc., 24 S. Sixth St., Newark 7, N. J.

(a) All types of plastic materials.

(b) To customers' specifications.

Breyer Molding Co., 24 N. Racine Ave., Chicago.

(a) DUREZ, PLASKON, BAKELITE and MONSANTO.

(b) All phenolic machine parts, sockets, plugs, etc.

Butterfield, T. F., Inc., 56 Rubber Ave., Naugatuck, Conn.

(a) LUCITE, TENITE, BAKELITE, DUREZ, BEETLE, MELAMINE, MAKALOT, RESINOX, FIBESTOS, PLASKON, LUMARITH and PLASTACELE.

(b) Molded electrical insulation and housings.

C

Caldwell Products Inc., 142 W. 24th St., New York.

(a) TENITE, LUMARITH, PLASTACELE, FIBESTOS, LUCITE, PLEXIGLASS, POLYSTYRENE, LUSTRON, LOALIN and NIXONITE.

California Plastic Moulding Co., 1702 E. 61st St., Los Angeles 1.

(a) BAKELITE, PLASKON, BEETLE, DUREZ, MONSANTO, etc., all thermosetting materials.

(b) Plastic aircraft and industrial parts.

Carter Products Corp., 6921 Carnegie Ave., Cleveland 3.

(a) TENITE I and II, POLYSTYRENE, VINYLITE and ethyl cellulose.

(b) Tubing, rod and various shapes for all types of machines.

Central Die Casting & Mfg. Co. Inc., 2935 W. 47th St., Chicago.

(a) TENITE, LUMARITH, and all other thermoplastics.

(b) All types of molded parts to 8 oz. in weight.

Chamberlain Engineering Ltd., Akron, O.

(a) All molding materials.

(b) To customers' specifications.

Chicago Die Mold Mfg. Co., 4001 Wrightwood Ave., Chicago 39.

(a) TENITE, BAKELITE, PLASKON, LUCITE, STYRON, etc.

(b) To customers' specifications.

Chicago Molded Products Corp., 1028 N. Kolmar Ave., Chicago.

(a) BAKELITE, DUREZ, RESINOX, PLASKON, BEETLE, TENITE, LUMARITH, SARAN, LUCITE and POLYSTYRENE.

(b) Automotive, aviation, industrial, electrical, mechanical, scientific, surgical, electrical and other parts molded to special order.

See advertisement, Page 270

Cincinnati Advertising Products Co., Plastics Div., 3274 Beekman St., Cincinnati 23.

(a) PLASTACELE, TENITE, LUMARITH, LUCITE, CRYSTALLITE, LUSTRON, POLYSTYRENE and VINYLITE.

(b) All types of injection molded machine parts.

Cincinnati Molding Co., 2037 Florence Ave., Cincinnati 6.

(a) BAKELITE, RESINOX, DUREZ, PLAS-

KON, BEETLE or any thermosetting plastic.

(b) Electrical, mechanical or decorative parts.

Claremould Plastics Co., 135 Jackson St., Newark 5, N. J.

(a) TENITE I and II, LUMARITH, PLASTACELE, LUCITE and POLYSTYRENE.

(b) All types of custom molded parts.

Cleveland Plastics Inc., 1611 E. 21st St., Cleveland 14.

(a) BAKELITE, BEETLE, CRYSTALITE, DUREZ, ETHOCEL, LUCITE, LUMARITH, MONSANTO, PLASKON, PLASTACELE, RESINOX, STYRON and TENITE.

(b) To customers' specifications.

Colt's Patent Fire Arms Mfg. Co., Hartford, Conn.

(a) All plastic materials.

(b) All types of machine parts.

Columbus Plastic Products Inc., 519 Dublin Ave., Columbus, O.

(a) TENITE, LUMARITH, PLASTACELE, POLYSTYRENE, LUCITE, CRYSTALITE and VINYLITE.

(b) All types of injection molded parts to customers' specifications.

Compression Molding Co., 3314 Morganford Rd., St. Louis 16.

(a) PLASKON, RESINOX, DURITE, BAKELITE, BEETLE, etc.

(b) Compression molded plastic parts.

Connecticut Hard Rubber Co., 407 E. St., New Haven, Conn.

(a) Synthetic rubbers, all types; hard rubber.

(b) Seals, gaskets, electrical insulation parts, etc.

Connecticut Plastic Products Co., 70 W. Liberty St., Waterbury, Conn.

(a) TENITE, LUMARITH, PLASTACELE, BAKELITE-Acetate, LUCITE, POLYSTYRENE, CRYSTALITE, and other thermoplastic materials.

(b) Business machine parts, camera cases, etc.

Consolidated Molded Products Corp., 309-29 Cherry St., Scranton 2, Pa.

(a) All types of molding material for compression, transfer and injection molding.

(b) Various machine parts.

Continental Can Co. Inc., Plastics Div., Cambridge, Ohio.

(a) BAKELITE, PLASKON, TENITE, LUMARITH, DUREZ, LUCITE, RESINOX, POLYSTYRENE and MR RESINS.

(b) All types of compression, injection and extruded parts, to customers' specifications.

Continental Diamond Fibre Co., Newark, Del.

(a) CELORON, DILECTO, DIAMOND FIBRE, VULCOID, DILECTENE, MICABOND, etc.

(b) Gears couplings, aircraft parts, electrical insulating parts, mechanical and chemical resistant parts.

Continental Plastics Corp., 308-314 W. Erie St., Chicago.

(a) Acetate butyrate, LUMARITH, POLYSTYRENE, ETHOCEL and LUCITE.

(b) Dummy spark plugs, refrigerator parts, cable clamps, bobbins, etc.

Cruver Mfg. Co., 2456-60 Jackson Blvd., Chicago.

(a) All thermoplastic materials.

(b) Typewriter, adding machine parts, etc.

Cutler-Hammer Inc., 315 N. 12th St., Milwaukee.

(a) THERMOPLAX and PYROPLAX.

(b) Terminal blocks, insulators, switch bases, knobs, handles, insulating bushings, arc shields and miscellaneous electrical insulating forms.

D

Davies Molding Co., Harry, 1428 N. Wells St., Chicago 10.

(a) Phenol-formaldehyde and synthetic ureas.

(b) Stock molded parts.

Diemolding Corp., Canastota, N. Y.

(a) BAKELITE, DUREZ, PLASKON, BEETLE, TENITE or any other plastics of similar nature.

(b) Control handles or knobs, small bases and plates, pulleys, pushbuttons, housings, etc.

Detroit Macoid Corp., 12340 Cloverdale Ave., Detroit 4.

(a) Thermoplastic materials by extrusion and injection molding.

(b) To customers' specifications.

Dillon-Beck Mfg. Co., 485—21st St., Irvington 11, N. J.

(a) All thermoplastic injection molding materials.

(b) For war effort; to customers' specifications.

Dimco Plastics, 207 E. Sixth St., Dayton 2, O.

(a) BAKELITE, DUREZ, PLASKON, TENITE, MELMAC, PLASTACELE, NIXONITE, POLYSTYRENE, VINYLITE, LUCITE, MASURON, and similar plastic materials.

(b) Aircraft control parts, bomb release handles, solenoid coil spools, handles for machine tools, electrical parts, etc.

E. F

Eclipse Moulded Products Co., Milwaukee.

(a) All plastic materials.

(b) Compression, injection and extrusion molded parts.

Erie Resistor Corp., 644 W. 12th St., Erie, Pa.

(a) All extrusion and injection molding of thermosetting materials.

(b) Aircraft, automobile, radio, refrigerator parts, three-dimensional knobs, bezels, etc.; also plastic molded around glass for instrument faces.

Extruded Plastics Inc., New Canaan Ave., Norwalk, Conn.

(a) Cellulose acetate butyrate (TENITE II), TULOX, INTERLOX, vinyl resins, ethyl cellulose and POLYETHYLENE.

(b) Seamless plastic tubing from ⅛-in. to 2 in. OD for oil lines, air lines, etc., also extruded plastic shapes.

Eelsenthal, G., & Sons, 4110 W. Grand Ave., Chicago 51.

(a) Acetate, LUCITE, POLYSTYRENE and other thermoplastic materials.

(b) To customers' specifications.

Firestone Rubber & Latex Products Co., Fall River, Mass.

(a) All compression and injection molding materials.

(b) Lenses, plastics over metal, refrigerator trim, cabinets and housings, electrical parts, etc.

Franklin Plastics Div., Robinson Industries Inc., Franklin, Pa.

(a) Thermoplastic materials.

(b) Automotive, refrigerator, radio, etc.

G

Garfield Mfg. Co., Garfield, N. J.

(a) BAKELITE, DUREZ, DURITE, HEMIT, GARIT and TEGIT.

(b) Hot and cold molded parts to customers' specifications.

Gemloid Corp., 7910-30 Albion Ave., Elmhurst, L. I., N. Y.

(a) PLEXIGLAS, LUCITE, TENITE I and II, PLASTACELE, STYRENE, SARAN, ETHOCEL, VINYLITE, etc.

(b) Gaskets, flexible and clear tubings, dials, knobs, etc.

General Electric Co., Plastics Divisions, 1 Plastics Ave., Pittsfield, Mass.

(a) TEXTOLITE (molded, laminated and cold-molded).

(b) All types to customers' requirements.

See advertisement, Page 293

General Industries Co., Elyria, O.

(a) BAKELITE, DUREZ, RESINOX, PLASKON, BEETLE, TENITE, LUMARITH, PLASTACELE, LUCITE and CRYSTALITE.

(b) Special parts to customers' specifications.

General Products Corp., Union Springs, N. Y.

(a) Cellulose acetate, LUCITE, VINYLITE, TENITE, BAKELITE, DUREZ, DURITE, RESINOX, PLASKON, BEETLE, MELMAC and rubber.

(b) Automotive ignition parts, electrical parts, radio, instrument cases, magneto and selsyn motor parts.

Gits Molding Corp., 4600 W. Huron St., Chicago.

(a) TENITE, LUMARITH, PLASTACELE, LUCITE, POLYSTYRENE, SARAN, VINYLITE, butyrates and ethyl cellulose.

(b) Radio knobs and cabinets, push-buttons, escutcheons, dials, supports and insulators.

See advertisement, Page 308

Great American Plastics Co., 180 Pond St., Leominster, Mass.

(a) Thermoplastics and thermosetting materials.

(b) Parts made of sheets, rods and tubes, and special shapes by injection, compression, transfer, hollow molding, forming and extruding.

Greene Plastics, Wakefield, R. I.

(a) All urea and phenolic materials.

(b) Automotive, marine, aircraft, and industrial machine parts.

Grigoleit Co., 740 E. North St., Decatur, Ill.

(a) BAKELITE, DUREZ, INDUR, PLASKON, TENITE and BEETLE.

(b) Molded closures, knobs, handles and injection molded parts.

Gulliksen Mfg. Co., Wm. M., Newton Lower Falls, Mass.

(a) BAKELITE, MAKALOT, PLASKON, BEETLE and DUREZ.

(b) Dies and molds to produce various shapes.

H, I, J

Haas Co., The, Mendon, Mich.

(a) BAKELITE, PLASKON, DUREZ and other thermosetting materials.

(b) All types of custom molded parts.

Hoosier Cardinal Corp., 601 W. Eichel, Evansville, Ind.

(a) TENITE, LUMARITH, PLASTACELE, ETHOCEL, LUCITE, CRYSTALITE, POLYSTYRENE and other thermoplastics.

(b) Nameplates and parts made to customers' specifications.

Ideal Plastics Corp., 23-10 43rd Ave., Long Island City 1, N. Y.

(a) All thermoplastic materials.

(b) To customers' specifications.

Illini Molded Plastics, 528 W. Chestnut, Hinsdale, Ill.

(a) BAKELITE, DUREZ, PLASKON, MONSANTO, LUCITE and POLYSTYRENE.

(b) Aircraft fairleads, grommets, connectors, adapters, bobbins and other electrical insulating components, water and steam valves, and foot valves for food industry.

Imperial Molded Products Corp., 2927 W. Harrison St., Chicago.

(a) BAKELITE, RESINOX, DUREZ, MAKALOT, PLASKON and BEETLE.

(b) Handles, knobs, controls, sub-assembly for mechanical working parts such as terminal blocks, insulators, contact blocks, housings, soda fountain parts, etc.

See advertisement, Page 276

Ingwersen Mfg. Co. Inc., 1800 S. Acoma St., Denver 10.

(a) RESINOX, TENITE, FIBESTOS, STYRON, SARAN, BAKELITE and VINYLITE.

(b) Handles, etc.

Injection Molding Corp., 115 Fourth Ave., New York.

(a) TENITE, LUCITE, LUMARITH, LUSTRON, STYRENE, PLASTACELE, etc.

(b) To customers' specifications.

Inland Mfg. Div., General Motors Corp., 2727 Inland Ave., Dayton 1, Ohio.

(a) All types of molding materials.

(b) To customers' specifications.

Insel Co., Schuyler Ave. ft. Quincy, Arlington, N. Y.

(a) All thermoplastic materials, cellulose nitrate, cellulose acetate, cellulose aceto-butyrate, ethyl cellulose and VINYLITE.

(b) Bushings, lenses, insulating tubing (flexible and rigid), etc.

Insulation Mfg. Co. Inc., 11 New York Ave., Brooklyn 16.

(a) BAKELITE, DUREZ, MAKALOT, RESINOX, LUCITE, CRYSTALITE, TENITE, LUMARITH, ELECTROSE, INSULATE, etc.

(b) Insulators and insulating parts, molded instrument and industrial parts.

Insulation Products Co., 504 North Richland St., Pittsburgh.

(a) BAKELITE, DUREZ, TENITE and PLASKON.

(b) Parts to customers' specifications.

Johnson Rubber Co., The, 111 Vine St., Middlefield, O.

(a) Molded rubber.

(b) Molded, extruded and cut parts.

K

Kampa Mfg. Co., 12132 W. Capitol Drive, Milwaukee.

(a) TENITE, STYRON, LUCITE, ETHYLCELLULOSE, LUMARITH and SARAN.

(b) Switch boxes, insulators and instrument case covers.

Keolyn Plastics Co., 2731 N. Pulaski Rd., Chicago.

(a) TENITE, LUMARITH, PLASTACELE, LUCITE, POLYSTYRENE, VINYLITE and other thermoplastics.

(b) To customers' specifications.

Keystone Specialty Co., 1373½ Cove Ave., Lakewood, O.

(a) Any plastic material to customers' specifications.

(b) Parts to customers' specifications.

Kilgore Mfg. Co., Plastics Div., Westerville, O.

(a) Cellulose acetate, POLYSTYRENE, butyrate acetates, ureas and phenolics.

(b) Compression and injection molded parts.

Kuhn & Jacob Molding & Tool Co., 1200 Southard St., Trenton 8, N. J.

(a) BAKELITE, DUREZ, BEETLE, PLASKON, TENITE, LUCITE, LUMARITH, etc.

(b) Compression molding of electrical, automotive, radio, airplane, instrument, permanent wave machine parts, etc.; also any type of injection molding.

Kurz-Kasch Inc., 1421 S. Broadway, Dayton, O.

(a) All types of thermosetting plastics.

(b) Radio instrument knobs, etc.

See advertisement, Page 165

L

Lanfare Molded Products, 1519 Freeman St., Toledo 6, O.

(a) PLASKON, DUREZ and TENITE.

(b) Commutator rings, etc.

Lionel Corp., The, 28 Sager Place, Irvington, N. J.

(a) BAKELITE, RESINOX, DUREZ, LUCITE, STYRON, TENITE, LUMARITH, cellulose acetate, NYLON and POLYSTYRENE.

(b) Switch cases, handles, terminal boards, connection blocks, telephone receiver cases, etc.

M

MacDonald Mfg. Inc., 536 Bedford Ave., New Baltimore, Mich.

(a) TENITE, ETHOCEL, LUMARITH, CEREX, LUCITE and POLYSTYRENE.

(b) To customers' specifications.

Mack Molding Co. Inc., Ryerson Ave., Wayne, N. J.

(a) BAKELITE, DUREZ, TENITE, BEETLE, LUMARITH, FIBESTOS and PLASKON.

(b) Parts to customers' specifications.

Martindell Molding Co., N. Olden at Sixth, Trenton, N. J.

(a) Cellulose acetates, phenolics and ureas.

(b) To customers' specifications.

Master Plastic Molding Corp., 1609 N. Broadway, St. Louis 16.

(a) LUCITE, LUMARITH, ETHOCEL, STYRON and CEREX.

(b) All injection molded parts.

McDonald Mfg. Co., 544 E. 31st St., Los Angeles 11.

(a) High strength low pressure paper base laminates.

(b) Coil forms to customers' specifications.

McDonnell Aircraft Corp., Plastics Div., Ambassador Bldg., St. Louis 1.

(a) STRUCTOMOLD, phenolic base paper and cloth laminates, fiberglas laminates and combinations of fiberglas and cloth laminates.

(b) Structural and semi-structural aircraft parts, radio cases and housings, radar cases, jettison gas tanks, refrigerator parts, etc.

Metal Specialty Co., 814 South L St., Richmond, Ind.

(a) ETHOCEL, TENITE, CRYSTALITE, LUCITE, POLYSTYRENE, LUMARITH, NIXONITE, etc.

(b) Automobile, radio and refrigerator parts.

Micamold Radio Corp., 1087 Flushing Ave., Brooklyn 6, N. Y.

(a) BAKELITE, PLASKON and acetates.

(b) Condensers and resistors.

Michigan Molded Plastics Inc., G and Baker Sts., Dexter, Mich.

(a) BAKELITE, DUREZ, TENITE, PLASTACELE, LUMARITH, PLASKON, LUCITE, SARAN and MONSANTO.

(b) Molded plastic parts, all types and sizes by compression, injection and extrusion.

Midwest Molding & Mfg. Co., 337 N. Whipple St., Chicago.

(a) BAKELITE, DUREZ, RESINOX, BEETLE and PLASKON.

(b) Terminal blocks, electrical parts, etc.

Mills Corp., Elmer E., 153 W. Huron St., Chicago 10.

(a) Thermoplastic materials including cellulose acetate, cellulose acetate butyrate, acrylates, methacrylates, styrenes, vinyls, vinylidene chloride, etc.

(b) Injection molding and extruding of machine parts.

Minnesota Plastics Corp., 366 Wacouta St., St. Paul 1, Minn.

(a) TENITE II, LUMARITH, PLASTACELE, FIBESTOS, LUSTRON, POLYSTYRENE, STYRON, VINYLITE, LUCITE and PLEXIGLAS.

(b) Cream separator parts, milking machine parts, mechanical refrigerator parts, machine tool parts, etc.

Modern Plastics Corp., 489 N. Shore Drive, Benton Harbor, Mich.

(a) BAKELITE, DUREZ, RESINOX, LUCITE, PLEXIGLAS, TENITE, LUMARITH, STYRENE, melamine, ethyl cellulose, SARAN and CEREX.

(b) Radio, automotive, washing machine, electrical and appliance parts.

Modglin Co., 3827 Verdugo Rd., Los Angeles 41.

(a) LUMARITH and any injection molding powder.

(b) Airplane parts.

Molded Products Co., 4533 W. Harrison St., Chicago.

(a) BAKELITE, DUREZ, RESINOX, MAKALOT, INDUR, PLASKON, BEETLE and MELMAC.

(b) To customers' specifications.

Molding Corp. of America Inc., 40 Church St., Pawtucket, R. I.

(a) All types of plastics.

(b) To customers' specifications.

Monaplastics Inc., Branchville Center, Georgetown, P.O., Conn.

(a) LUCITE, LUSTRON, FIBESTOS, PLASTACELE, TENITE, STYRON, TENITE II, etc.

(b) To customers' specification. Specially equipped to handle insert moldings in one piece.

N, O

National Lock Co., 1902 Seventh St., Rockford, Ill.

(a) DUREZ, BAKELITE, MAKALOT, RESINOX, TENITE, LUMARITH, PLASTACELE, LUCITE, PLEXIGLAS, ETHOCEL, MELMAC, PLASKON and BEETLE.

(b) Washing machine agitators, magneto rotors and ignition parts.

National Plastics Inc., 2330 McCalla Ave., Knoxville 2.

(a) Thermosetting and thermoplastic compounds.

(b) Handwheels (lathes, etc.), sheaves, separators, idlers, take-up roll bearings and other textile machine parts, etc.

National Plastic Products Co., Odenton, Md.

(a) TENITE I and II, ETHOCEL, POLYSTYRENE and SARAN.

(b) T-shapes, moldings, rods (any shape within a 2-inch circle in continuous lengths).

North & Judd Mfg. Co., New Britain, Conn.

(a) RESINOX, BAKELITE, LUMARITH, PLASKON, LUCITE, PLEXIGLAS and BEETLE.

(b) Conduit insulators, etc.

Northern Industrial Chemical Co., 7 Elkins St., South Boston, Mass.

(a) BAKELITE, DUREZ, BEETLE, PLASKON, TENITE, LUMARITH, etc.

(b) Telephones, radio, ignition and electrical parts, etc.

Northwest Plastics Inc., 2233 University Ave., St. Paul, Minn.

(a) BAKELITE, INDUR, DUREZ, MAKALOT, LUCITE, RESINOX, BEETLE and PLASKON.

(b) Industrial parts of all types.

Norton Laboratories Inc., 520 Mill St., Lockport, N. Y.

(a) BAKELITE, DUREZ, PLASKON, BEETLE, TENITE, LUMARITH, LUCITE, CRYSTALITE and PLASTACELE.

(b) Housings, terminals, bushings, wheels, knobs, handles, etc. All types of compression and injection molding.

Oris Mfg. Co. Inc., 1 Jackson St., Thomaston, Conn.

(a) BAKELITE, DUREZ, RESINOX, BEETLE and PLASKON.

(b) Handwheels, bushings, etc.

Owens-Illinois Glass Co., Toledo, O.

(a) DUREZ, BAKELITE, RESINOX, PLASKON UREA, MELAMINE, BEETLE LUMARITH, TENITE I and II, POLYSTYRENE, SARAN and ETHOCEL.

(b) Aircraft machine small parts, water pump valve seats, followers, packing nuts, electric motor brush-holder screws, line connectors, etc.

P

Paragon Plastics Inc., 911 Western Ave., Seattle 4.

(a) PLASKON urea and melamine, BEETLE, MELMAC, BAKELITE, Phenols and Ureas, ETHOCEL, VINYLITE, DUREZ and POLYSTYRENE (STYRON).

(b) Motor housings, generator collector rings, instrument handles, insulating parts, electrical junction boxes, generator collector ring assemblies, etc.

Paulis Plastics Co., H., 215-221 E. Washington Blvd., Los Angeles 15.

(a) BAKELITE, PLASKON, TENITE, PLASTACELE and LUMARITH.

(b) Compression and injection molded parts.

Peerless Molded Plastics Inc., 401 Hamilton St., Toledo, O.

(a) DUREZ, RESINOX, BAKELITE, TENITE, LUMARITH, LUCITE and PLEXIGLAS.

(b) Electrical, mechanical, radio, automotive, camera, etc.

Perfection Plastic Products, 900 Passaic Ave., East Newark, N. J.

(a) All thermosetting materials.

(b) Compression and transfer molding; mostly communication and airborne radio parts.

Pierce Plastics Div., Visking Corp., The, 6733 W. 65th St., Chicago 38.

(a) TENITE, SARAN, LUSTRON, VINYLITE, LUMARITH, ETHOCEL, PLEXIGLAS, LUCITE and GEON.

(b) Screen, filament, tubing, trim, etc.

Pittsburgh Plastics Co., 1304 Fifth Ave., New Kensington, Pa.

(a) BAKELITE, DUREZ, PLASKON, and other thermosetting materials.

(b) Air corps and ordnance parts, etc.

Plastex Corp., The, 402 Mt. Vernon Ave., Columbus, O.

(a) All types of thermosetting and thermoplastic materials.

(b) Any fabrication or extrusion to customers' specifications.

Plastic & Die Cast Products Corp., 1010 E. 62nd St., Los Angeles 1.

(a) BEETLE, PLASKON, BAKELITE, DUREZ, TENITE, LUSTRON, STYRON and LUMARITH.

(b) Radio cabinets, etc.

Plastic Engineering, Inc., 8506 Lake Ave., Cleveland 2.

(a) TENITE, LUMARITH, LUSTRON, PLASTACELE, CHEMACO, LUCITE, POLYSTYRENE, VINYLITE, etc.

(b) Airplane parts, circulator fans, closures, fire extinguisher parts, radio parts, refrigerator parts, etc.

See advertisement, Page 314

Plastic Industries Inc., 160 Northfield Rd., Bedford, O.

(a) Phenolic or thermosetting materials.

(b) Various machine parts.

Plastic Manufacturers, Inc., Stamford, Conn.

(a) All types of thermosetting and thermoplastic materials.

(b) Aircraft control pulleys, terminal blocks, gun turret control grips, collector ring assemblies and turret swivel joints.

See advertisement, Page 168

Plastic Molding Corp., Sandy Hook, Conn.

(a) BAKELITE, DUREZ, RESINOX, MAKALOT, BEETLE, PLASKON, RESIN-X-CREPE, LUCITE, FIBESTOS, LUMARITH, TENITE I, etc.

(b) Insulators, wiring devices, bases, housings, connectors, etc.

Plastic Moldings Corp., The, 859 Hathaway St., Cincinnati 3.

(a) DUREZ, BAKELITE, RESINOX and PLASKON.

(b) Handles, cases, closures, brackets and parts to customers' specifications.

Plastic Products Inc., 415 Lexington Ave., New York.

(a) Any material which can be compression or injection molded.

(b) To customers' specifications.

Plastics Inc., 813 Main St., Avon, N. J.

(a) BAKELITE, TENITE, LUCITE, LUMARITH and PLASTACELE.

(b) Refrigerator, automotive, etc.

Plastimold Inc., 61 Union St., Attleboro, Mass.

(a) TENITE, BAKELITE, DUREZ, RESINOX, MAKALOT, BEETLE and PLASKON.

(b) Specialize in large housings, etc., compression molding.

Precision Plastics Co., 1724 W. Indiana Ave., Philadelphia.

(a) TENITE I and II, LUMARITH, FIBESTOS, PLASTACELE, LUSTRON, LOALIN, LUCITE, CRYSTALITE, ETHOCEL, VINYLITE and POLYSTYRENE.

(b) Radio accessories, instrument parts, etc.

Pyro Plastics Co., The, 526-532 North Ave. East, Westfield, N. J.

(a) TENITE, PLASTACELE, LUMARITH, FIBESTOS, POLYSTYRENE, LUCITE and CRYSTALITE.

(b) To customers' specifications.

R

Rathbun Molding Corp., 290 Rochester St., Salamanca, N. Y.

(a) PLASKON, BEETLE, BAKELITE, DUREZ, MELMAC, RESINOX, DURITE and MAKALOT.

(b) Electrical parts, instrument parts, knobs and handles.

Recto Molded Products Inc., Appleton & B. & O. RR., Cincinnati.

(a) BAKELITE, DUREZ, RESINOX, PLASKON, TENITE, LUCITE, CRYSTALITE and MAKALOT.

(b) Control balls (all sizes) and handwheels.

Reinhold Plastic Mfg., F. E., 7001 McKinley Ave., Los Angeles.

(a) All types of thermosetting materials for compression molding. Press capacity 40-750 tons.

(b) Aircraft, photographic and industrial assembly parts.

Remler Co. Ltd., 2101 Bryant Ave., San Francisco.

(a) BAKELITE, DUREZ, PLASKON, TENITE, etc.

(b) Electric terminals and switch parts, housings, handles, levers, operating keys and buttons, gears, etc.

Reynolds Molded Plastics Div., Reynolds Spring Co., Cambridge, O.

(a) BAKELITE, PLASKON, TENITE, LUMARITH, DUREZ, LUCITE, RESINOX and POLYSTYRENE.

(b) All types to customers' specifications by compression, injection and extrusion molding.

Richardson Co., The, 27th and Lake Sts., Melrose Park, Ill.

(a) INSUROK, EBROK, RUB-TEX and RUBEROK.

(b) All types to customers' specifications.

See advertisement, Page 254

Royal Moulding Co., 69 Gordon Ave., Providence, R. I.

(a) BAKELITE, DURITE, RESINOX, DUREZ, PLASKON, BEETLE and MAKALOT.

(b) Electrical appliance housings.

S

St. Louis Plastic Moulding Co., 4605 Olive St., St. Louis.

(a) Cellulose acetate, POLYSTYRENE, VINYLITE, cellulose acetate butyrate (TENITE II), and LUCITE (methyl methacrylate).

(b) Extruded and injection molded parts.

Santay Corp., 351 North Crawford Ave., Chicago.

(a) Ethyl cellulose, cellulose acetate, cellulose acetate butyrate, polystyrene, methacrylates, etc.

(b) Radio, electrical, automotive, etc.

Shaw Insulator Co., 150 Coit St., Irvington, N. J.

(a) All plastic materials.

(b) All types of parts.

Sheller Mfg. Corp., Portland, Ind.

(a) SHELLERITE, all types of thermosetting, thermoplastic and rubber materials.

(b) Compression and injection molded parts such as steering wheels, panels, cabinets, etc.

Southern Plastics Co., 906-908 Main St., Columbia, S. C.

(a) TENITE I and II, BAKELITE, LUMARITH, PLASTACELE and practically all thermoplastics and thermosetting plastics.

(b) Cotton loom sheaves, tubing, bearings, nameplates, strips, links, etc.

Specialty Insulation Mfg. Co. Inc., Hoosick Falls, N. Y.

(a) COLASTA, BAKELITE, DUREZ, TENITE, BEETLE, PLASKON, etc.

(b) Aircraft, electrical, household, radio, business machine parts, etc.

Standard Plastics Co., 62 Water St., Attleboro, Mass.

(a) Methyl-methacrylate, cellulose acetate, polystyrene and various thermosetting materials.

(b) All types of injection and compression molded parts.

Standard Products Co., 505 Boulevard Bldg., Detroit.

(a) BAKELITE, RESINOX, DUREZ and other thermosetting materials; TENITE, LUMARITH, POLYSTYRENE, ETHOCEL, LUCITE, PLEXIGLAS, LUSTRON, STYRON and other thermoplastics.

(b) Automotive, refrigeration panels and accessories, radio cabinets and parts, electrical housings, appliance parts, aircraft parts, etc.

Sterling Injection Molding Inc., 277 Military Rd., Buffalo.

(a) LUMARITH, FIBESTOS, TENITE I and II, ETHOCEL, PLASTACELE, VIN-

YLITE, SARAN, LUCITE, PLEXIGLAS, POLYSTYRENE and other thermoplastics.
(b) Handles, rollers and other injection molded machine parts.

Sterling Plastics Co., 1140 Commerce Ave., Union, N. J.

(a) LUCITE, TENITE, LUMARITH, POLYSTYRENE, CRYSTALITE, butyrate and acetate.
(b) Knobs, cigarette vending machine parts, nameplates, dehydrator tubes and dials for aircraft, compasses, etc.

Stokes Rubber Co., Jos., Taylor and Webster Sts., Trenton, N. J. (Plant also at Welland, Ont., Canada)

(a) All types of thermosetting and thermoplastic materials, and hard rubber.
(b) Parts made by compression or injection molding.

Superior Plastic Co., 426 N. Oakley Blvd., Chicago.

(a) TENITE, LUMARITH, POLYSTYRENE, LUCITE and ETHOCEL. All types of injection molding and extrusion.
(b) To customers' specifications.

T

Tech-Art Plastics Co., 41-01 36th Ave., Long Island, N. Y.

(a) All plastic materials.
(b) Compression and injection molded plastic parts for electrical and mechanical equipment and instruments.

Telex Products Co., Telex Park, Minneapolis.

(a) Compression materials, BAKELITE, BEETLE, etc.
(b) Transmitter cases, control knobs, cord connectors, receiver caps, control housings, etc.

Terkelsen Machine Co., 326 A St., Boston.

(a) DUREZ, INDUR, MAKALOT, BAKELITE, PLASKON and BEETLE.
(b) To customers' specifications.

Ther Electric & Machine Works, 17 S. Jefferson St., Chicago.

(a) DUREZ, BAKELITE, PLASKON, etc.
(b) To customers' specifications.

Tupper Plastics, Farnumsville, Mass.

(a) TENITE I and II, LUMARITH, PLASTACELE, FIBESTOS, MACITE, BAKELITE, NIXON and other thermoplastics.
(b) Lenses, washers, molded screws, studs, knobs, handles, socket plugs, etc.

U, V

United Plastics Corp., 3828 E. 91st St., Cleveland.

(a) Thermosetting materials, DUREZ, BAKELITE, etc. and thermoplastics.
(b) Small functional parts not over 7 oz.

United States Stoneware Co., Akron, O.

(a) Compression molding and extruding of TYGON synthetic resins.
(b) To customers' specifications.

Universal Plastics Corp., 235 Jersey Ave., New Brunswick, N. J.

(a) All materials which can be compression and injection molded.
(b) To customers' specification.

Valley Plastics, Grafton, Mass.

(a) TENITE, PLASTACELE, LUMARITH, FIBESTOS and other thermoplastic injection materials.
(b) Knobs, handles, trim, etc.

Van Norman Molding Co., 6441 S. State St., Chicago.

(a) BAKELITE, DUREZ, DURITE, MONSANTO, PLASKON, BEETLE and other thermosetting materials.
(b) Electrical meter cases and bases, connectors, etc.

Victor Metal Products Corp., 196 Diamond St., Brooklyn 22, N. Y.

(a) Materials for injection, compression and transfer molding.
(b) Parts requiring high impact material, such as rollers, wheels, etc.

Voges Mfg. Co., The, 98 St. & 103 Ave., Ozone Part 17, N. Y.

(a) Acetate, polystyrene, methacrylate and any other thermoplastic materials.
(b) To customers' specifications.

W

Warren Plastics Corp., Warren, Pa.

(a) BAKELITE, DUREZ, RESINOX, BEETLE, PLASKON and MASURON.
(b) Small machine parts and plastic closures.

Waterbury Companies, Inc., The, 39 River St., Waterbury, Conn.

(a) BAKELITE, DUREZ, BEETLE, PLASKON, TENITE, LUCITE, SHELLAC COMPOSITION, LUMARITH, RESINOX, CRYSTALITE, POLYSTYRENE, etc.
(b) All types to customers' specifications.

Watertown Mfg. Co., 138 Echo Lake Rd., Watertown, Conn.

(a) NEILLITE, BAKELITE, DUREZ, RESINOX, TENITE, LUMARITH, FIBESTOS, PLASTACELE, LUCITE, POLYSTYRENE, BEETLE, PLASKON, cellulose acetates and ethyl cellulose.
(b) Contact blocks, insulator blocks, switch housings, cams, spacers, radio cabinets, cases, washing machine agitators, insulation parts and any other moldable parts.

Werner Co. Inc., R. D., 380 Second Ave., New York.

(a) Cellulose acetate, cellulose acetate butyrate, ethyl cellulose, polystyrene, and the vinyl resins.
(b) Trim, hose, gaskets, angles, channels, special shapes, rods and tubes, etc.

White Dental Mfg. Co., The S. S., Plastics Dept., 10. E. 40th St., New York.

(a) All thermoplastic and thermosetting materials.
(b) Stock molded parts.

Windman Brothers, 3325 Union Pacific Ave., Los Angeles.

(a) BAKELITE, DUREZ, PLASKON, BEETLE, all phenolics and ureas; styrenes, acrylic resins and TENITE or cellulose acetates.
(b) Electric razor cases, radio cabinets, electrical, mechanical, dental, photographic and surgical equipment parts.

Worcester Moulded Plastics Co., 8 Grafton St., Worcester 8, Mass.

(a) TENITE, LUMARITH, SARAN, PLASTACELE, FIBESTOS, LUCITE, CRYSTALITE, POLYSTYRENE, STYRON, LUSTRON, LOALIN, VINYLITE and other thermoplastic materials.
(b) All types of thermoplastic molded parts.

Machine Finishes Producers

Reference letters beneath addresses of companies refer to: (a) Trade-name and type of finish, availability in color; (b) Method of application and drying; and (c) Characteristics and use of finish.

A

Acme White Lead & Color Works, 8250 St. Aubin Ave., Detroit.

(a) Nitro-cellulose lacquers, oil and varnish types.

(b) Information not available.

(c) Protection against rust, absorption of oil, and decorative purposes.

Alrose Chemical Co., P. O. Box 1294, Providence, R. I.

(a) JETAL, black finish for ferrous metals; OXIDINE Z, a black nonreflecting finish for zinc and zinc plate; OXIDINE B, a black finish for copper and brass; OXIDINE CI, black finish for cast iron; BON WHITE, lustrous immersion tin finish for brass and copper.

(b) Chemical oxidation by immersion.

(c) Decorative, rustproofing, heat-resisting; for machines and appliances.

Aluminum Co. of America, Gulf Bldg., Pittsburgh.

(a) ALROK (aluminum oxide) colorless, bluish or greenish grey. ALUMILITE (aluminum oxide) colorless, dyed colors.

(b) ALROK—chemical; ALUMILITE—electrolytic.

(c) ALROK, corrosion and abrasion resistant; applied to aluminum parts for protection or as surface preparation for painting. ALUMILITE, better resistance to corrosion and abrasion; used for protection and decorative applications.

Aluminum Industries Inc., 2438 Beekman St., Cincinnati.

(a) PERMITE lacquer, paint, enamel and varnish, available in green, black, white and gray; also PERMITE aluminum, available in aluminum only.

(b) PERMITE lacquer, paints, etc. are applied by brushing, spraying, dipping, flowing, etc., and air-dried and baked. PERMITE aluminum is sprayed, brushed or dipped.

(c) Paints and lacquers are for government specification only at present time, for all types of machines used by the government. The aluminum finish is heat-resisting and is used for hospital equipment, refrigerators, etc.

American Pipe & Construction Co., P. O. Box 3428, Terminal Annex, Los Angeles 54.

(a) AMERCOAT synthetic resin enamel coating; in gray, black, white, red and aluminum.

(b) For brushing, spraying or dipping; drying by evaporation of solvents.

(c) Primarily rustproofing; for machinery subjected to acids, alkalis and salt solutions.

American Products Mfg. Co., Oleander & Dublin Sts., New Orleans, La.

(a) INCELOID cellulose and resin bases, in all colors and iridescent.

(b) May be applied by any method; atmosphere and oven dried.

(c) Decorative; on all standard types of machines.

Apollo Metal Works, 6605 S. Oak Park Ave., Chicago

(a) APOLLO pre-chromed metal, in bright and satin chrome and satin striped patterns.

(b) Plating.

(c) For conserving brass, copper, aluminum, nickel where corrosion resistance or reflectivity is desired.

Arco Co., The, 7301 Bessemer Ave., Cleveland.

(a) ARCO lacquers, synthetics and oil enamels; available in standard machine tool gray or special shades. INFRAY paint in standard colors of the U. S. Army Engineers Corps.

(b) Adaptable for any application method; air or force dried.

(c) ARCO is rust, heat and oil-resistant, for all industrial machinery. INFRAY is infra-red-reflecting, heat-reflecting and low visibility paint, developed primarily to meet war needs.

Armstrong Paint Varnish Works, 1330 S. Kilbourn Ave., Chicago.

(a) ARMSTRONG paint, lacquer, enamel, varnish, etc., in all colors.

(b) All methods of drying and application.

(c) Rustproofing, decorative and heat-resisting; on all types of machines.

Ault & Wiborg Corp., 350 Fifth Ave., New York 1.

(a) POLYMERIN speedbake enamel, WRINKLE enamel, AULTONE lacquers, and PROTEKTOL stripping lacquer; all available in colors.

(b) POLYMERIN and WRINKLE applied by spraying and dipping; baked (all methods including infra-red). AULTONE applied by spraying; air-dried. PROTEKTOL applied by brushing and spraying; air-dried.

(c) Decorative, protective, heat and cold-resistant; for any part suitable for baking or other drying schedules.

See advertisement, Page 264

Auto Sun Products Co., 529 Poplar St., Cincinnati 14.

(a) SUN chrome, nickel, silver, copper nickel, tin, cadmium zinc, black nickel plating. Also SUN paint, lacquer and enamel in white black, gray, green, ivory, blue, red and brown.

(b) Electroplated. Paints for brushing, dipping, spraying; electric, gas and air-dried.

(c) Plating for rustproofing and decorative purposes in war work and commercially on radios, automobiles, etc. Paints also for decoration and rustproofing of radios, automobiles, aircraft, etc.

B

Baltimore Enamel & Novelty Co., P. O. Box 928, Baltimore 3.

(a) DURA-SHEEN porcelain enamel; paint and lacquer; in any color. Also ARMOR-VIT in olive drab, black and gray.

(b) Paint, lacquer applied by brushing, dipping and spraying; automatic and air drying. ARMOR-VIT applied by spraying only and cured at 250-750 deg. F.

(c) Used for rustproofing, decoration; is heat-resistant; for panels, small machinery, metal assemblies and exhaust tubes. ARMOR-VIT highly resistant to rust, corrosion, impact, acids, alkalis and heat.

Benjamin Electric Mfg. Co., Des Plaines, Ill.

(a) CRYSTEEL porcelain enamel on steel, in white, gray, red, green, blue, yellow and other special colors.

(b) Applied by spraying; dried by firing at 1550 deg.

(c) For decoration, rustproofing, protection; heat-resistant; providing reflecting surface in lighting equipment.

Berry Brothers, 211 Leib St., Detroit 7.

(a) BERRY No. 10 synthetic gray primer; No. 97 blue gray synthetic machinery enamel (semigloss); No. 5 red pyroxylin primer; No. 26 blue gray synthetic machinery lacquer; No. 625 red oxide primer; and No. 16BQ.D. blue gray machinery enamel (semigloss).

(b) No. 625 may be brushed or sprayed and dries over night; No. 16B recommended for spraying, is dust-free in 30 minutes and dries in 3-4 hours; Nos. 10 and 97 are fast air-drying synthetics.

(c) No. 10 is used for castings and sheet steel. All are used for general machinery purposes.

Bownes, Frank Co., Chelsea, Mass.

(a) MODENE, mill whites and synthetic enamels and special finishes.

(b) For spray, brush and dip; air dried and baked.

(c) Decorative, protective; for machine tools.

C

Carpenter-Morton Co., 77 Sudbury St., Boston.

(a) CARMOTE and LARCOLOID enamels, varnishes, etc., in a large variety of colors.

(b) Applied in all ways; air dried or baked.

(c) For rustproofing, decoration and preservation; on metalworking, woodworking, textile and other types of machines.

Chemical Research Corp., P. O. Box No. 2002 Tulsa 1, Okla.

(a) RESISTAL HCL-340-A, -400, G-100, M-600; water-clear coatings, for metals and alloys.

(b) All can be brushed, sprayed or dipped, while G-100 type can be applied by roller coating methods; dry dust-free in 10 minutes.

(c) G-100 has excellent adhesion to all wood and metal surfaces; HCL-340-A to all metal aircraft exteriors without use of primer. All are tough, nonporous, durable, and have high dielectric strength.

Chicago Vitreous Enamel Products Co., Armor-Vit Div., 1425 South 55th Court, Cicero, Ill.

(a) ARMOR-VIT inorganic finish; in black and olive drab.

(b) Sprayed.

(c) Rustproofing, abrasion and heat-resistant, thermal shock-resistant. For iron and steel and at present largely applied to Army and Navy materiel.

Chromium Corp. of America, 120 Broadway, New York. (Plants in Waterbury, Conn., Cleveland and Chicago.)

(a) CRODON chromium plating (also copper, nickel, etc.).

(b) Electroplating.
(c) Decorative, rustproofing, hardness; for various types of machines.

Colonial Alloys Co., Technical Processes Div., Ridge Ave. and Crawford St., Philadelphia 29.
(a) PREPLATE plating process on aluminum in colors adaptable to plated coatings (wide range). ELECTRODIZING anodizing of aluminum and magnesium in all colors including pastels. CHEMOXIDE aluminum finish in red, brown, gold, green, black and gray.
(b) PREPLATE, electroplated; ELECTRODIZING, anodized; and CHEMOXIDE dipped.
(c) PREPLATE is abrasion and corrosion resistant; has good appearance and rubber adhesion; for use wherever aluminum is required. ELECTRODIZING is decorative, corrosion resistant, hard surfacing, and has good electrical insulation; for wherever aluminum is used. CHEMOXIDE is corrosion-resistant, also for application wherever aluminum is used.

Cooper Alloy Foundry Co., 200 Bloy St., Hillside, N. J.
(a) LUSTRACAST electrolytic finish.
(b) Electroplating.
(c) Decorative and protective.

Creutz Platers Inc., S.E. Third and Vine, Cincinnati 2.
(a) Gold, silver, copper, nickel, cadmium; anodizing, lacquering and plating.
(b) Plating, spraying, etc.; oven, air drying.
(c) Decorative and rustproofing.

D

Davis Co., The H. B., 1600 Bayard St., Baltimore 30.
(a) Magnesium, steel, stainless steel, aluminum and black iron finish; also paints, enamels and varnishes, both in all colors.
(b) Both for spraying, dipping and brushing; the paints drying by air, baking or force drying.
(c) For decoration, rustproofing, heat resistance.

Day, James B., & Co., 1872 Clybourn Ave., Chicago.
(a) NITROLITE lacquer enamel; and a synthetic baking enamel.
(b) lacquer sprayed or dipped and air dried; enamel sprayed and baked.
(c) Decorative; for metal machine parts.

Densol Paint Co., 9808 Meech Ave., Cleveland.
(a) DENSOTECH and DENSOL machine tool finishes. Former available in clear liquid; latter in NTBA gray, light gray, maroon, red, olive green and white.
(b) For brushing, spraying or dipping.
(c) Former for rustproofing and to preserve bright-plated finish on metal parts; DENSOL for use on all types of machine tools.

Dibble Color Co., 1497 East Grand Blvd., Detroit.
(a) DIBBLE standard machinery finishes in gray, black, white and red.
(b) for brushing, spraying; air drying, baking.
(c) Rustproofing; for milling and broaching machines, lathes, presses, etc.

DiNoc Mfg. Co., 1700 London Rd., Cleveland.
(a) DI-NOC film involving special process to reproduce wood grains and other effects.
(b) May be applied to steel, wood and composition material, or furnished in form of prefinished sheets.
(c) Heat, cold and salt-spray resistant. For radios, automobiles, airplanes, air conditioning units, business machines and similar equipment.
Can only be furnished for War contracts due to allocation of vital materials.

Du-Lite Chemical Corp., Middletown, Conn.
(a) DU-LITE black oxide steel finish, and chemifinishes (black)—steel, copper, and zinc.
(b) Steel finish dipped; while the chemifinishes are immersed in hot chemical solution.
(c) Both are for rustproofing and decoration; tough; uniform. For aircraft, tank and marine engines, instruments and other machine parts.

Durez Plastics & Chemicals Inc., North Tonawanda, N. Y.
(a) DUREZ protective coating resins, in clear, black, white, or colors.
(b) For air drying, baking, direct heat or infra-red.
(c) Alkali, acid, solvent, and oil-resistant; weather-resistant primers for ferrous and nonferrous metals, and for finishing coats.

E

Egyptian Lacquer Mfg. Co., 1270 Sixth Ave., New York.
(a) EGYPTIAN lacquers and synthetics, in clear and standard colors; also to match
(b) For spraying, dipping or brushing; air drying and baking.
(c) For protection and decoration, on all types of metal, and machine tools.

Enterprise Galvanizing Co., Cumberland & Almond Sts., Philadelphia.
(a) Hot dip galvanizing zinc silver-colored finish.
(b) For dipping.
(c) For use where corrosion resistance is required. In laundry machines, refrigeration, ice, textile and electrical machines, etc.

Erie Enameling Co., Erie, Pa.
(a) ERIE porcelain, inorganic; in any standard color.
(b) Dipping and spraying; fused in cast iron or steel.
(c) Acid, rust and corrosion resisting, providing slippery glass-hard surface. For chemical conveyor buckets, bed plates, photographic equipment, pipes and valves.

Esser Co., T. C., 3107 W. Galena St., Milwaukee 8.
(a) Industrial enamel, paint and varnishes in all colors.
(b) For brushing, spraying, dipping; air-baked or infra-red dried.
(c) For protection and decoration on all types and sizes of machines.

F

Felton, Sibley & Co. Inc., 136-44 N. 4th St., Philadelphia 6.
(a) No. 9412 high-gloss machinery enamel in standard tool gray; also another high-gloss and egg shell gloss machinery enamel in four grays and standard tool gray.
(b) No. 9412 is brushed and sprayed; air-dried in 1 hour; while the other enamel is brushed and sprayed also, and air-dried.
(c) Both are for decoration, rustproofing and oil-proofing, for all types of machine tools.

Ferro Enamel Corp., 4150 East 56th St., Cleveland.
(a) FERROC inorganic porcelain finishes; in all colors and shades.
(b) For spray, dip; fire at approx. 1500 deg F.
(c) Decorative, rustproofing, cleanliness. For food, chemical processing, textile machinery, etc.

Ferro Enameling Co., 1100-57th Ave., Oakland 1, Calif.
(a) FERRO-PORCELAIN enamel in all colors and shades.
(b) For spraying or dipping; heat dried.
(c) For decoration, rustproofing and heat resistance; for food machinery, pumps, etc.

Forbes Varnish Co., 3800 W. 143 St., Cleveland.
(a) NITROLOID light primer, HV-8175 and NITROLOID 7B NMTB machinery gray, HV-4209 lacquer.
(b) Sprayed; air dried.
(c) General protection, oil-resistant. For all light and heavy machinery.

Frazer Paint Co., 2475 Hubbard, Detroit.
(a) FRATEX synthetic enamel and TUFTEX machinery enamel. Former in 20 standard enamels or special colors to match. Latter in 10 standard shades or special to match color.
(b) For spray or brush; air dry.
(c) For decoration and protection for all metal machinery.

Frost Paint & Oil Corp., 1209 N.E. Tyler, Minneapolis 13.
(a) FROST'S paints, varnishes, enamels, lacquers in all standard colors and tints.
(b) For spray, brush, flow or dip; air, bake, and infra-red drying.
(c) Decorative, rustproofing, anticorrosion, heat and acid resistant, etc.; for machines of all kinds.

G

George Co., The P. D., 5200 N. 2nd St., St. Louis 7.
(a) PEDIGREE paint, enamel and varnish in any color.
(b) Brush or spray; air drying and baking.
(c) Decoration and protection; on all types of machines.

Glidden Co., 11001 Madison Ave., Cleveland 2.
(a) METALESCENT finish in all colors; VULCOTE lacquer and enamel in cream buff, green gray, light moss green, moss green, ocean green and orange.
(b) Former for spraying, and the latter for brushing, spraying or dipping, and air drying or baking.
(c) METALESCENT offers protection to all types of metal equipment; while VULCOTE gives protection and aids sight, for machine tools particularly.

Grand Rapids Varnish Corp., 565 Godfrey Ave., S.W., Grand Rapids 2, Mich.
(a) GUARDSMAN lacquers, enamels and varnishes in any color; and GUARDSMAN chrome, copper and aluminum in all metallic colors.
(b) Former for brushing, spraying, dipping and flowing; air or force dried. Latter are sprayed.
(c) For application on all types of machines.

H

Hague, Alfred, & Co., Inc., 227—34th St., Brooklyn.
(a) RUBALT No. 269 enamel; available in custom colors.
(b) Can be applied by any method; air dried or low baked.
(c) Rustprofing; for any type of machinery.

Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6.
(a) Modified XXX bright nickel finish. Company also produces copper, chromium, cadmium, zinc, lead, tin, bronze, brass, and silver finishes.
(b) Electroplating.
(c) Corrosion resistance, protection, rustproofing and decoration.

Haynes Laboratories Inc., C. W., Chandler St., Springfield, Mass.
(a) Lacquers and synthetics in any color.
(b) Brush and spray; air dry.
(c) For coating any type of machine.

Heatbath Corp., Springfield 1, Mass.
(a) PENTRATE, penetrating finish in black only; PX finish available in black only.
(b) Immersion in boiling solutions; air-dried.
(c) PENTRATE for all steels except stain-

less; is rust-resisting, friction-reducing and has durability and good appearance. PX is for stainless steel, cast and malleable iron parts.

Heresite & Chemical Co., 822 South 14th St., Manitowoc, Wis.

(a) HERESITE phenol-formaldehyde resin finish in brown, gray, black, olive green and cream. VR-500 air-drying series, in black, brown and gray.

(b) HERESITE is sprayed, dipped, flow and roller-coated; oven-baked. VR-500 applied by spraying, dipping and brushing.

(c) HERESITE is resistant to acids, alkalis and solvents, rustproofing and also salt-water resistant. Use coating on rayon and textile machinery, torpedo parts, blowers and other machine parts.

Hilo Varnish Corp., 42 Stewart Ave., Brooklyn.

(a) HILO paints, lacquers, enamel synthetics in all colors; varnish, etc. Also black japans, and protective coatings to meet government specifications.

(b) For brushing, spraying, dipping, flow coating, roller coating, and tumbling; infra-red and air drying.

(c) Used for rustproofing and protecting all types of machines, equipment, etc.; also for protective concealment.

Hollingshead Corp., R. M., 840 Cooper St., Camden, N. J.

(a) WHIZ rust preventative compounds.

(b) Sprayed, dipped or brushed.

(c) For rustproofing. Used by U. S. Govt. for internal and external protection of all kinds of automotive and aircraft engines, etc.; as well as protection of rough castings and newly machined metal parts.

Hommel, O., Co., 209 Fourth Ave., Pittsburgh.

(a) HOMMELAYA and OHCOTE vitreous type coating in any color or shade.

(b) HOMMELAYA for spray or dip; drier equipment. OHCOTE for spraying.

(c) Decorative, resistant to corrosion, heat and abrasion, acid and salt spray. For any type of machine.

Hooker Glass & Paint Mfg. Co., 651 Washington Blvd., Chicago.

(a) KING machine and engine enamel available in color. No. 6132 standard machine tool gray enamel.

(b) For brush or spray; air dry.

(c) Decorative, protective, KING enamel for gas engines, steam engines, presses, machine tools, dynamos, etc. No. 6132 for woodworking and metalworking machinery.

Horn Co., A. C., Horn Bldg., Long Island City 1, N. Y.

(a) Custom-made finish; paint, lacquer, enamel, varnish, etc.; in any color.

(b) Brushing, spraying, flow coating, dipping, etc.; air-dried, oven-baked and infra-red lamp drying.

(c) For all types of machines.

Houghton & Co., E. F., 303 W. Lehigh Ave., Philadelphia 33.

(a) HOUGHTO-BLACK black oxide finish for blackening steel parts.

(b) By immersion in 295 deg F salt bath.

(c) Used where mild corrosion resistance and improved luster is desired. For war material, industrial machines, etc.

I

Impervious Varnish Co., Rochester, Pa.

(a) Blue Bar machinery enamel (plastic type), in a full range of colors.

(b) For spraying and dipping.

(c) Protection and decoration. For machine tools, woodworking machines, etc.

Indium Corp. of America, 1676 Lincoln Ave., Utica, N. Y.

(a) INDIFUSED Indium, silver luster finish.

(b) Plating and diffusion.

(c) Wear and corrosion resistant, decorative and functional; for nonferrous metals, etc.

See advertisement, Page 312

Irvin, Jewell & Vinson Co., 17 E. Third St., Dayton, O.

(a) ANCO plastic paste form paint in special colors and white.

(b) For spraying, rubbing in, etc.; air dried, infra-red light dried, low heat.

(c) For use in filling indentations in plastic parts such as auto dials, refrigerators, etc.

J

Jalco Motor Co., Union City, Ind.

(a) JALCO lacquer-enamel, in black and Army drab.

(b) Sprayed; air-dried and baked.

(c) Rustproofing, decoration; for windshields, etc.

Jones-Dabney Co. Industrial Div., Devoe & Reynolds Co. Inc., 1481 S. 11th St., Louisville 8, Ky.

(a) SYNTEX synthetic enamel in all colors. LUMIBRILLIANT in practically all shades, but particularly dark colors.

(b) SYNTEX applied by brush, spray, flow, dip, etc.; air-dried and baked. LUMI-BRILLIANT is sprayed.

(c) SYNTEX offers protection and appearance, for refrigerators, washing machines, automobiles, farm equipment, etc. LUMI-BRILLIANT is for protection and appearance in automobiles only.

Krome-Alume Inc., 241 Bewley Bldg., Lockport, N. Y.

(a) KROME-ALUME plated aluminum finish.

(b) Plating.

(c) For plating aluminum with nickel and chromium for decorative purposes; with nickel and chromium for wear resistance in machine parts; with brass for rubber adhesion; with copper for soldering by ordinary means and with such corrosion-resistant metals as cadmium, zinc, etc.

L

Lawrence & Co., W. W., 1124 West Carson St., Pittsburgh 19.

(a) Paint, varnish, lacquer, enamel, etc., in standard colors.

(b) Applied by spraying, brushing flow coating, dipping, etc.; for air drying, baking, etc.

(c) For all types of machines.

Liquid Plastic Div., Ferro Enamel Corp., 4150 E. 56th St., Cleveland.

(a) VEDOC organic paints in all colors to meet government specifications, or individually compounded. Also, VEDOC synthetic finish, available in colors.

(b) For spraying and dipping; baked.

(c) Decorative and protective; VEDOC organic finish for trucks, shells, mines, etc. VEDOC synthetic for washing machines, refrigerators, etc.

Long Jr. Co., Charles R., 1630-1644 W. Hill St., Louisville, Ky.

(a) STABRITE machine enamel in any color; also STABRITE wrinkle finish in any color except white.

(b) Machine enamel for brush, spray, flow or dip; air dry or bake. Wrinkle finish for spraying only, and baking.

(c) Protective and decorative heat and oil resistant. Also special formulation for resistance to acids, alkalis, chemicals etc. For use on inner or outer surfaces of all types of machines. Supplied in wrinkle or smooth finish.

Lowe Brothers Co., 424 E. Third St., Dayton F-2, O.

(a) Lacquers, air-drying and baking enamels and paints in a wide variety of shades.

(b) Brush or spray, or both.

(c) Decorative and rustproofing; for machine tools and miscellaneous machinery.

M

Maas & Waldstein Co., 438 Riverside Ave., Newark, N. J.

(a) METALUSTRE lacquer enamels and synthetic enamels available in 28 standard colors. RAYDUR synthetic enamels in most colors. DUART WRINKLE enamels in most colors. CODUR enamels in colors. DYKAST lacquer enamels in most colors.

(b) METALUSTRE, spray, air dry and bake; RAYDUR, spray or dip, bake (Infra-red) ovens; DUART, spray; CODUR, spray or dip; and DYKAST, spray and dip, air dry.

(c) Decorative and protective coatings; METALUSTRE is used for sheet metal work and castings; RAYDUR on any machine requiring a tough, durable finish; DUART for cabinets and metal or Bakelite parts that can be baked; CODUR for any type of machine requiring moisture and chemical resistant finish; and DYKAST for zinc and aluminum die castings.

Malleable Asphalt Co., 6355 Broadway, Chicago 40.

(a) Malleable asphalt compositions: Fibrous trowelling consistencies, liquid paints, fiberous coatings, etc. Offered in black. Also F-oil metal paint in red, gray, green, black and aluminum.

(b) Asphalt compositions: brush, spray, dip and trowel; air or oven drying. Metal paint is for spraying, dipping or brushing.

(c) Asphalt composition is for waterproofing, acid-proofing, and corrosion-proofing; for tanks, vats, pits, ovens, kilns, etc. Metal paint prevents rust and corrosion in tanks, vats, etc.

McDougall-Butler Co. Inc., Buffalo 5.

(a) HARDCOTE synthetic finishes in many color combinations; also varnishes, enamels, and paints.

(b) Brush, spray or dropper method; and dries dust-free in 15 min; hard in one hour.

(c) For inside or outside surfaces of wood, metal or plastics; corrosion-resistant.

Merkin Paint Co. Inc., M. J., 1441 Broadway, New York, 18, N. Y.

(a) MERKIN industrial enamel in colors.

(b) For brushing or spraying; air dried.

(c) For protective and decorative purposes on any machine where durability and "light-for-seeing" are factors.

Metaplast Co., 205 West 19th St., New York.

(a) METAPLATE plating of all metals on plastics.

(b) Plating.

(c) Decorative.

Miller Co., J. Walter, Lancaster, Pa.

(a) Metallic finishes and lacquer in clear, gold and black. Also copper, brass, nickel, tin and zinc plating.

(b) Brush, dip and spray; air-dried or steam-heated room.

(c) For rust prevention and decorative purposes.

Mitchell-Bradford Chemical Co., 2446 Main St., Bridgeport, Conn.

(a) BLACK-MAGIC, DIE-CAST BLACK and WITCH DIP, blackening salt for steel, iron, copper and zinc. Also SILCO vitreous coating, in dull finish which may be buffed to egg-shell gloss, as well as black, Army drab and Navy gray.

(b) BLACK-MAGIC, DIE-CAST BLACK and WITCH DIP for dipping, self-drying; SILCO for spraying; baking and infra-red drying.

(c) BLACK-MAGIC, DIE-CAST BLACK and WITCH DIP is decorative and rustproofing. For fabricated steel and wire parts, screw machine parts, small arms, etc. SILCO for engine exhaust manifolds, mufflers, etc.

Mobile Paint Mfg. Co. Inc., 78 Dauphin St., Mobile 9, Ala.
(a) B.L.P. machinery enamel in any color.
(b) Spray or brush; air-dried.
(c) For rust-resistance, heat-resistance and decoration. For all types of machines.

Monsanto Chemical Co., Merrimac Division, Everett Sta., Boston 49.
(a) MONSANTO lacquers and enamels, and lacquer-enamel, in all standard colors.
(b) All sprayed or dipped; lacquer-enamel and lacquer air-dried; enamel is air-dried and baked.
(c) Protective, decorative coating; for all types of machines.

N. O

New Jersey Lacquer Co. Inc., 4400-4402 Dell Ave., North Bergen, N. J.
(a) PYROLAC lacquers, synthetic coatings; available in all colors.
(b) For spray, dip, brush; air dry and bake.
(c) Decorative, heat resistant, rustproofing; for industrial machinery, cinema projectors, cameras, typewriters, scales, electric instruments, navigation instruments, sound detection devices, electronic instruments, radar devices, etc.

New Wrinkle Inc., Dayton, O.
(a) WRINKLE enamel in all colors.
(b) Applied by spraying; oven or infra-red dried.
(c) Decorative and protective; for all types of machines.

Nikolas & Co., G. J., 1227-1235 Van Buren St., Chicago (also 33 Grand St., Brooklyn, N. Y.).
(a) NIK-O-LAC lacquer in all colors.
(b) For brushing, spraying and dipping; air drying.
(c) For decorative and heat-resistant purposes; for all types of machines.

Ohio Bronze Powder Co., 1120 E. 152nd St., Cleveland.
(a) LUXRITE bronze powders, in silver, gold, copper and other shades.
(b) Plating, spraying or dipping; air drying.
(c) Rustproofing, heat-resisting and decorating; on agricultural and other types of machinery.

O'Neil Duro Co., 2156 S. Fourth St., Milwaukee.
(a) DURO lacquer and synthetic enamel in any color.
(b) For brush, flow, spray or dip; for baking, air drying or infra-red radiation.
(c) Decorative, rustproofing, heat resisting, etc. For all types of machines.

P. Q

Parker Rust-Proof Co., 2177 East Milwaukee Ave., Detroit.
(a) PARKERIZING, BONDERIZING and PARCO LUBRIZING.
(b) Spray or dip.
(c) Rustproofing and as a base for paint, lacquer, enamel and oil finishes. PARCO LUBRIZING for bearing surfaces to prevent scuffing.

Pemco Corp., Baltimore 24.
(a) PEMCO porcelain enamels. Glazes in any color.
(b) For spray and dip; continuous dryer.
(c) Decorative and rustproofing; for all types of machines.

Peninsular Paint & Varnish Co., 8250 St. Aubin Ave., Detroit.
(a) KLEEN-EZY and PENPROX, paint, varnish, enamel and lacquer; in all colors.
(b) For brush, spray or dip; air drying or baking.
(c) Decorative, rustproofing, heat resisting, etc.; for all types of machinery.

Perry-Austen Mfg. Co., 250 Parkinson Ave., Grasmere, Staten Island 5, N. Y.
(a) PAVOR chemical-resisting paint, in gray, red, yellow, green white and black. PANOFLAM enamel in gray white, black and tints.
(b) Paint for brush or spray; air-dried. Enamel for brush or spray; air-dried or force-dried.
(c) For protection against corrosion, acids and alkalis; for structural materials in tanks and other types of machines.

Philadelphia Rustproof Co., 3229 Frankford Ave., Philadelphia.
(a) Chromium, cadmium, zinc, etc.
(b) Plating.
(c) all types of machines.

Pittsburgh Plate Glass Co., Industrial Paint Div., Grant Bldg., Pittsburgh.
(a) Pittsburgh Lavax machinery enamels, varnishes, lacquers and special process machine finishes.
(b) Suitable for all methods of application.
(c) Decorative and protective finishes for all types of machines.

Porcelain Metals Inc., 28-20 Borden Ave., Long Island City, N. Y.
(a) SUPORCEL porcelain enamel, in all colors and textures.
(b) For spraying; hot air, then firing at 1550 degrees Fahr.
(c) Decorative, where sanitation, permanency of finish and easy cleaning is required.

Pratt & Lambert Inc., 75 Tonawanda St., Buffalo 7.
(a) P & L machine tool enamel and other enamels, paints, lacquers, varnishes, etc.; in any color.
(b) Brush, spray, flow, dip; air-dried and baked.
(c) Decorative and protective; for all types of machines.

Pyrene Mfg. Co., 560 Belmont Ave., Newark 8, N. J.
(a) UDYLITE, cadmium finish, in silvery-white; BRIGHT ZINC in silvery white; PYRENE BRIGHT NICKEL, thick deposits of high brilliance; BONDERITE, in gray paint base; CHROMIUM; ALUMILITE; PARKERIZING, silvery to variety of black finishes. ANODIZING by Alumilite process for protection and finishing of aluminum and its alloys. Also IRIDITE and CRONAK olive drab, black and yellow finishes for zinc, and PYLUMIN aluminum finish.
(b) Udylite, Bright Zinc, Bright Nickel and Chromium plating; Bonderite, Parkerizing immersion; Alumilite, electrolytic; Parkerizing chemical displacement without changing dimensions or physical characteristics.
(c) Rustproofing, decoration, as base for plating, or for wear resistance.

Quigley Co. Inc., 527 Fifth Ave., New York 17.
(a) TRIPLE-A industrial enamels in maroon, green, red, orange, gray, blue, buff, yellow, black, white, and aluminum.
(b) For brushing and spraying; dries by evaporation.
(c) Protective, waterproofing coating used on wide range of machinery and equipment.

R

Reilly Tar & Chemical Corp., 1615 Merchants Bank Bldg., Indianapolis.
(a) RESISCOTE paint, in gray, etc.
(b) Brush or spray; air dried or baked.
(c) Rustproofing, protection against corrosive gases, etc.; for all types of machines.

Roxalin Flexible Lacquer Co., 806 Magnolia Ave., Elizabeth, N. J.
(a) ROXAPRENE synthetic enamel, in all colors; RINCONTROL wrinkle enamel, in practically all colors.
(b) For spraying and dipping; RINCONTROL only for spraying.
(c) Both are decorative and corrosion resistant; ROXAPRENE used for air conditioning equipment, etc.; RINCONTROL used for business and electrical appliances.

Ruberoid Co., 500 Fifth Ave., New York.
(a) RUBEROID rapid asphalt paint, in black only.
(b) For spraying and dipping.
(c) Rustproofing, resistance to high temperature, acid fumes, etc. For cables, tubing, tanks, battery boxes, etc.

Rustless Iron & Steel Corp., 3400 E. Chase St., Baltimore 13.
(a) Electroplating, and Black Oxide finish for stainless steel; the latter available in black.
(b) Applied electrolytically (anodic); while the Black Oxide is dipped in molten caustic dichromates.
(c) Plating is for decorative, rust and heat resistance for wire parts too intricate for buffing; while the Oxide finish is for ordnance purposes and is heat and rust-resisting.

See advertisement, Page 271

S

Sapolin Co. Inc., 229 East 42nd St., New York 17.
(a) SAPOLIN paints in all colors.
(b) Spray, brush, or dip.
(c) For decorative and protective purposes; for office machines, industrial, etc.

Seaporcel Corp., 28-20 Borden Ave., Long Island City, N. Y.
(a) SEAPORCEL ceramic finish; in all colors.
(b) For spraying; hot air, then firing at 1550 deg. F.
(c) Tenacious, will not chip unless base metal is fractured, will not corrode, heat-resisting, permanence of finish, ease of cleaning.

Seidlitz Paint & Varnish Co., 18th and Garfield Ave., Kansas City, Mo.
(a) SEIDLITZ wrinkle finishes, synthetic enamels and primers, in snow white, black and all colors.
(b) For brushing, spraying or dipping; air dry or bake.
(c) Decorative and protective; for all kinds of machinery.

Sewall Paint & Varnish Co., 1306 River St., Dallas, Tex., and Sta. A, Kansas City 7, Mo.
(a) Engine and machinery enamels in engine gray, battleship gray, chrome green, dark blue, Brewster green and black.
(b) Brush or spray; air-dried.
(c) Decoration, rustproofing and heat resistance; for all types of machinery and engines.

Sherwin-Williams Co., 101 Prospect Ave., Cleveland.
(a) Sherwin-Williams enamels; also paints, varnishes and lacquers to suit individual requirements, and heat resistant finishes.
(b) Brush or spray; air drying or baking.
(c) For application to all types of machines. Enamels save finishing time; are durable.

Simoniz Co., 2100 Indiana Ave., Chicago.
(a) COROL removable rust preventive, semi-hard, in various grades to fit Government specifications and manufacturing requirements.
(b) For spraying, dipping and brushing; air-drying.
(c) For rust and corrosion prevention on all types of machines.

Sonneborn Sons Inc., L., 88 Lexington Ave., New York.
(a) SONNEBORN'S machine and engine enamel in 14 colors. No. 3738 heat resisting gray enamel in light gray, and S.R.P. No. 75 red primer in reddish brown.
(b) Brush or spray; dry by air overnight.

(c) Machine and engine enamel is for decoration, oil-proofness, durability and withstanding heat up to about 200 deg. F. Type S.R.P. No. 75 is used for rustproofing on various types of machines.

Southern Lacquer Co., 1426 Philpot St., Baltimore.

(a) CONFIDENCE BRAND lacquer in all colors.

(b) Brush, spray and dip; air drying and baking.

(c) Decorative and protective; for all types of machines.

Standard Varnish Works, 2600 Richmond Terrace, Staten Island, N. Y.

(a) ROCKLOID wrinkle or smooth nonalkyd enamel in all colors. RINKOLIN wrinkle alkyd enamel in all colors. STANTOX synthetic enamel in all colors. STANDLAC lacquer in all colors. SVW aluminum lacquer or paint in aluminum only.

(b) ROCKLOID wrinkle is sprayed while the smooth finish is sprayed or dipped; both being baked. RINKOLIN sprayed and baked. STANTOX sprayed and air-dried. STANDLAC sprayed and air-dried. SVW aluminum is sprayed, dipped or brushed; air-dried or baked.

(c) All are protective and decorative coatings; for all types of machines.

T

Thompson & Co., 1085 Allegheny Ave., Oakmont, Pa.

(a) RABAKE enamel (infra-red bake), in white, gray and green. GRAY METALLIC dull aluminum finish. Also, Photo Finish lacquer in all colors, flat finish for plastics.

(b) RABAKE and GRAY METALLIC sprayed and baked for short period. Photo finish is sprayed and air-dried.

(c) RABAKE for heat resistance and marproofness of light gage housings. GRAY METALLIC finish is decorative. Photo Finish is lusterless, and adhesive to most molded plastics.

Thomas Paint Co., A. H., 456 Broad St., Waverly, N. Y.

(a) Paint, enamel and varnish, to match users' standard.

(b) Brush, spray and dip; air and low-temperature bake.

(c) for rustproofing, heat-resistance, acid and alkali-proofing and decoration; for heavy machines.

Thomson-Porcelite Paint Co., 3rd and Brown Sts., Philadelphia 23.

(a) PORCELITE enamel, paint and varnish in gray, red, blue, green, yellow orange and white.

(b) Brush, spray, flow and dip; air-dry, force-dry, and bake (infra-red or oven).

(c) For decoration, rustproofing; for all types of machine tools.

Thurmalox Co., Doylestown, Pa.

(a) THUR-MA-LOX finish in gray, green, white, black and aluminum.

(b) For spraying and brushing.

(c) Heat resisting on hot metal surfaces.

Tremco Mfg. Co., 8400 Kinsman Rd., Cleveland 4.

(a) PERMAVAR enamel, in alkali-proof green, brown, light buff, orange, medium gray, royal blue, fire engine red, primary yellow and verdi green.

(b) Brush or spray; air-dried.

(c) For decoration and protection against acids, alkalis, fumes, etc.; for all types of machines.

Triskalite Corp., 67 Wall St., New York.

(a) TRISKALITE white chromium-like deposits.

(b) Electroplating; hot-air, hot-water evaporation.

(c) Decorative and rustproofing.

Tropical Paint & Oil Co., 1276 West 70th St., Cleveland.

(a) TROPELITE varnish (100 per cent Bakelite), available in clear, black and gray; A.C.B. primer and finishing coats in red, gray, and black.

(b) TROPELITE can be applied by any method; A.C.B. by brush or spray; both air-dried.

(c) TROPELITE is alkali, acid and moistureproof and A.C.B. is a rustproofing and decorative coating; both can be used on all kinds of machinery.

Truscon Laboratories Inc., Caniff & G.T.R., Detroit.

(a) SPEEDREX enamel paint, in standard machine tool gray and other colors to order.

(b) Spraying, dipping or brushing; air-dry or force-dry.

(c) Rustproofing, decorative, low heat resistance; for machine tools or machines used on outside work such as concrete road spreaders, etc. Chemical and weather-resistant.

U

United Chromium Inc., 51 E. 42nd St., New York.

(a) UNICHROME alkaline copper plating; ANOZINC anodic treatment in black and yellow, and UCILON lacquer in white, black, gray and green, also clear.

(b) Unichrome copper can be plated; zinc can be anodized UCILON by brushing or dipping.

(c) The copper plating and zinc anodizing are for decorative and protective purposes; lacquer is resistant to acids and alkalis.

United Platers Inc., 991 Madison Ave., Detroit.

(a) UNIMATIC chrome, nickel, copper, cadmium, tin, zinc, lead, brass, bronze, stainless steel passivating, aluminum anodizing, etc., finish.

(b) Plating, dipping, tumbling, hot lead coating, parkerizing, natural and oxidized finishes.

(c) Decorative, rustproofing, wear and heat resistant; for use on all kinds of machines.

U. S. Gutta Percha Paint Co., Providence 1, R. I.

(a) RICE'S Oxidized machine enamel, one-coat machine enamel, and standard machine tool gray enamel. The first two are available in five colors; plus black; while the Standard Machine Tool gray is available in eggshell finish, and 7-B light and 617 dark gray shades.

(b) Brushing, spraying and dipping.

(c) Decorative, rustproofing, heat-resistant, and resistant to lubricating oils; on all types of machines, trucks, conveyors, piping and other interior equipment.

United States Stoneware Co., 105 Tallmadge Circle, Akron, O.

(a) TYGON synthetic plastic coating in black, red, gray, green, white, clear and blue. TYGON F is available in black.

(b) Applied by any conventional method; air-dried or baked.

(c) TYGON is corrosion-resistant, while Type F is solvent resistant, and heat resistant to 225 deg. F. Both applicable to any type of machine.

V

Valentine & Co. Inc., 11 E. 36th St., New York.

(a) NITRO VALSPAR lacquer, in all colors and shades; VALENITE enamel in all colors.

(b) NITRO VALSPAR for spraying or dipping; air or bake. VALENITE for spraying, brushing or dipping; air-dried or baked.

(c) Both decorative and preservative; for all types of machines.

Varnish Products Co., 5208 Harvard Ave., Cleveland.

(a) CEL-U-LAC lacquer in all colors.

(b) Dip, spray, flow; air-dried.

(c) Decorative and rustproofing; for appliances, office equipment, machine tools, dairy machines, etc.

Vitreous Steel Products Co., Box 1791, Cleveland 5.

(a) VITREO porcelain enamel in all colors.

(b) Spray and dip; in continuous dryers.

(c) Decorative, heat-resisting, rustproofing, chemical and abrasion-resisting; for use on machines where a permanent, easily cleaned finish is desired.

Voltax Co. Inc., 5 Reservoir Ave., Bridgeport 6, Conn.

(a) Enamel in green, gray, buff, black, red and white.

(b) Brush and spray; air-dried.

(c) For decoration of all types of machines.

Watson-Standard Co., 225 Galveston Ave., Pittsburgh 30.

(a) R/x prescription finishes in paint and lacquer, in colors to match requirements.

(b) Applied by all methods.

(c) Properties to suit requirements; for all types of machines.

Western Paint & Varnish Co., Duluth 8, Minn.

(a) Machinery enamel in red, green, blue, gray, yellow and black.

(b) Brush or spray.

(c) Rustproofing and decorating; for motors, tractors and other farm machines.

Whitlam Mfg. Co., J. C., Wadsworth, O.

(a) VERTEX Elastic Enamel in aluminum gray.

(b) For brushing, spraying or dipping; air drying in 3 or 4 hours, or bake for 1 hour at 250 deg. F.

(c) Oilproof, heat and light resistant; finish is for decorating, rustproofing, etc., on all types of machines.

Wilbur & Williams Co., Park Square Bldg., Boston 16.

(a) TOTRUST enamel (synthetic resins and specially treated oils) in various colors.

(b) Brush, spray or dip.

(c) Abrasion-resistant, rust-preventive finish; for trucks, tractors, production machinery, railroad and industrial machinery, etc.

Woolsey Paint & Color Co. Inc., C. A., 229 W. 42nd St., New York.

(a) WOOLSEY finish in all standard colors.

(b) Brush, spray or dip.

(c) Wear, corrosion and heat-resistant; for decorative purposes; for marine and other engines.

Y

Yarnall Paint Co., Grays Ave., W. of 54th St., Philadelphia 43.

(a) PERFECTION aluminum finish in aluminum and gray; also YARLITE enamel in all colors.

(b) Aluminum finish sprayed, brushed or dipped; enamel applied by all methods, air-dried and baked.

(c) Aluminum is for decoration and heat resistance; while enamel is for decoration, heat and abrasion resistance.

Zapon Div., Atlas Powder Co., North Chicago, Ill.

(a) ZAPON QS-978 machine enamel in all colors. QE-452 metallescent lacquer enamel in gray, green, brown and blue.

(b) QS-978 is brush or spray, air-dried. QE-452 is sprayed.

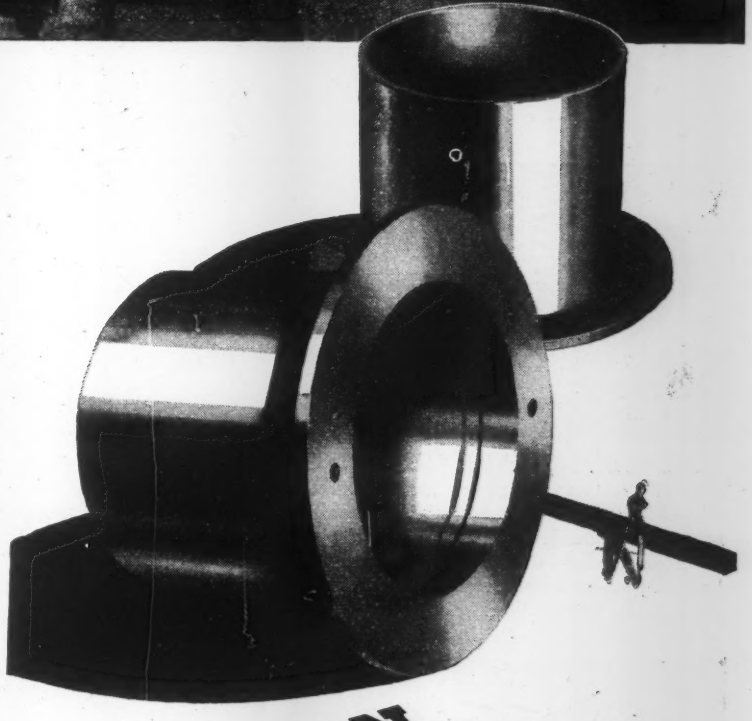
(c) Both are decorative and protective; for machine tools and other industrial machinery.

RIGHT...

on the nose

Precision is never achieved by accident. In producing Sleeve Type Bearings it is the net result of many factors. You start with the knowledge of, and a fine appreciation for, the need for accuracy. To this you add skill . . . developed by years of experience. Then you employ up-to-date methods . . . specialized equipment. Finally, you make constant checks and rechecks . . . a highly developed system of inspection. Only in this way can you produce bearings that are *exactly* in accordance with the specifications.

Our ability to supply bearings that are RIGHT in every respect is one reason why so many leading manufacturers depend on us for *all* their requirements. Advice and counsel on postwar bearing requirements is now available. Call in a Johnson Engineer TODAY.



JOHNSON BRONZE CO.

525 S. MILL ST. NEW CASTLE, PA.

Branches in 18 Industrial Centers

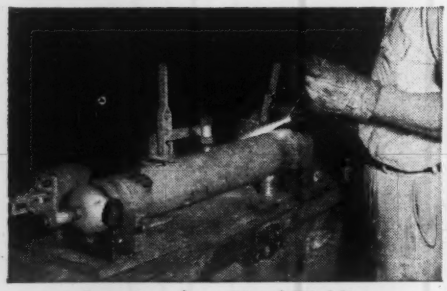
JOHNSON
SLEEVE BEARING HEADQUARTERS
BRONZE

Buy Bonds for Keeps

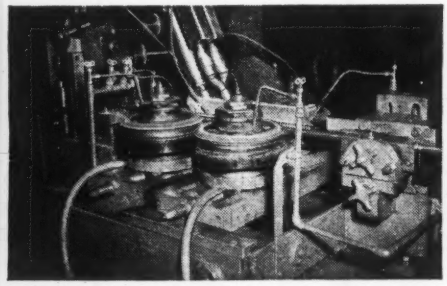
LINDE METHODS AND EQUIPMENT

HELP TO SPEED PRODUCTION AND TO LOWER OPERATING COSTS

Oxy-acetylene processes are used throughout industry to speed up production, to conserve materials, to lower operating costs, and to simplify maintenance and repair. Some of the many oxy-acetylene applications are outlined here.



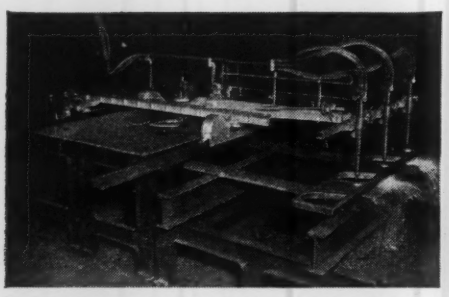
Oxy-Acetylene Hand-Welding



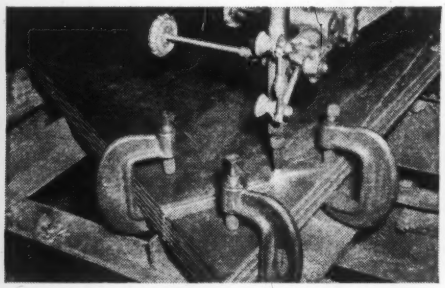
Oxy-Acetylene Machine-Welding

Hard-Facing

WELDING with the oxy-acetylene flame makes possible the joining of practically any metals —like or unlike—so that the weld is as strong as the base metal itself. Oxy-acetylene welding is used extensively in the fabrication of sheet metal products, because it produces high-quality joints quickly at low cost. Many operations are best adapted to assembly by hand-operated blowpipes. Products such as steel tubing can be fabricated from steel strip moving at high speeds through forming rolls and the edges joined by oxy-acetylene flames. Hard-facing with HAYNES STELLITE alloys applied by means of the oxy-acetylene flame makes parts that are subject to abrasion, heat, or corrosion last from two to twenty-five times longer.



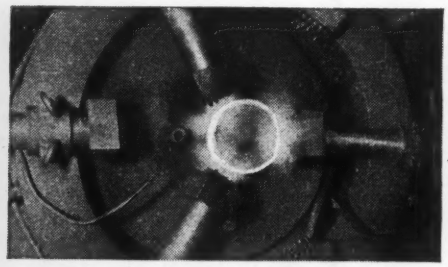
MACHINE SHAPE-CUTTING quickly produces simple or intricate steel shapes with clean-cut edges that usually require no machining. This method is also used for bar and billet cut-off, for straight-line cutting, and for preparation of plate edges prior to welding.



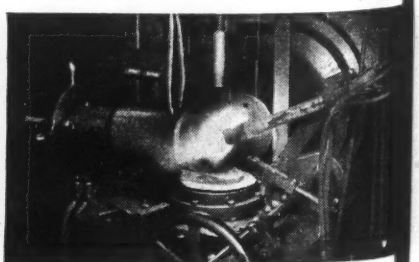
STACK-CUTTING of tightly clamped piles of plate is an adaptation of shape-cutting to permit fast production of quantities of identical parts. This oxy-acetylene method usually is faster and more economical than shearing or other mechanical methods.

GOUGING — With OXWELD hand-cutting blowpipes equipped with gouging nozzles, a groove of surface metal can be removed without harm to adjacent areas. Hand-cutting quickly severs gates and risers from castings to reduce machining operations.

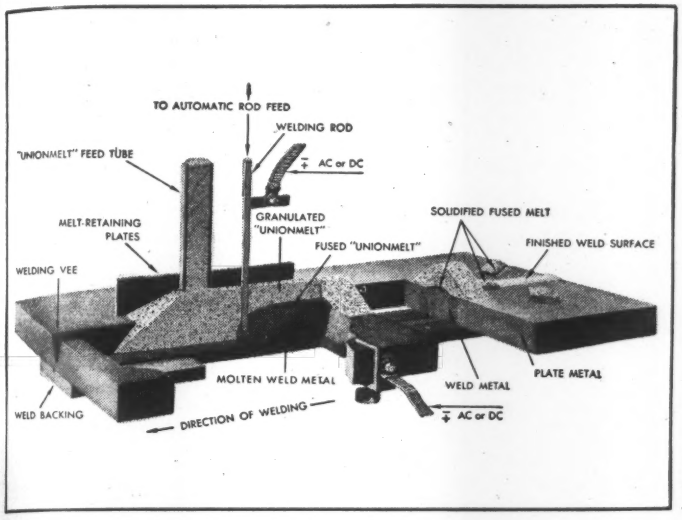
FLAME-PRIMING removes loose scale, rust, and surface moisture from steel prior to painting—making paint go on faster, bond tighter, and last longer.



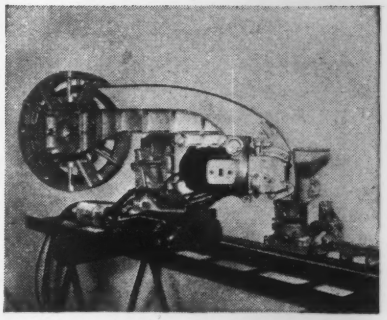
FLAME-HARDENING is used to impart a hard, wear-resistant case to steel and iron parts without affecting the toughness of the core.



FLAME-SPINNING — Tubing heated by oxy-acetylene flames while spun rapidly can be quickly end-formed to eliminate deep-drawing operations.

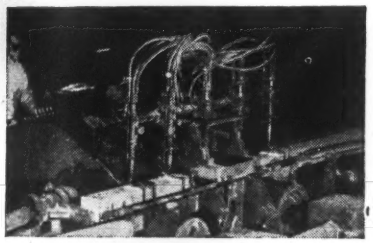


This sketch shows how a UNIONMELT butt weld is made.



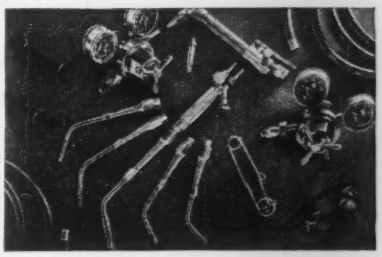
UNIONMELT WELDING

UNIONMELT electric welding is a unique automatic process that makes welds of unusually high quality in any thickness of metal at high speeds. Once the speed and current values are established by the operator, the "human element" is eliminated as a factor in producing good welds. UNIONMELT welding is done under a protective blanket of a special granulated material—without flash, glare, or sparks. The rod is fed automatically as work progresses and is thoroughly mixed with the molten base metal. For these reasons, UNIONMELT welding is widely used in the fabrication of pressure vessels, pipe, railroad equipment, tankers, and ships.



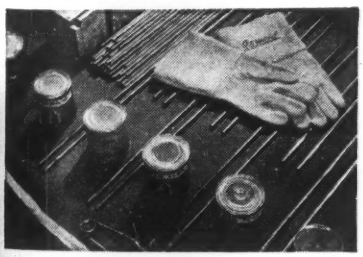
MACHINE APPARATUS

Included in the OXWELD line of apparatus are portable and stationary oxy-acetylene machines for cutting shapes or straight lines; flame-hardening apparatus; bar and billet cut-off machines; automatic welding equipment; and tractor units for plate-edge preparation.



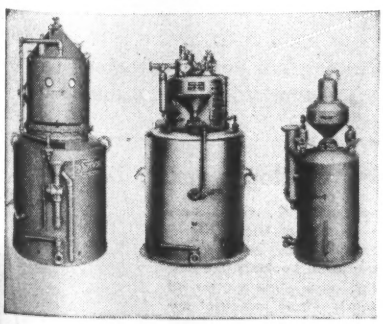
HAND APPARATUS

Oxy-acetylene apparatus which may be ordered from Linde includes oxy-acetylene blowpipes for all welding and heating work; oxy-acetylene cutting blowpipes, cutting attachments, and nozzles; and oxy-acetylene descaling and flame-priming equipment. OXWELD apparatus is supplied from Linde offices and warehouses. The PUROX and PREST-O-WELD line, and PREST-O-LITE air-acetylene appliances for soldering and brazing, are distributed by industrial and automotive jobbers.



WELDING RODS AND SUPPLIES

The many kinds and sizes of OXWELD high quality welding rods make it possible to select the one that will give best results on each job. The OXWELD line also includes fluxes, gloves, goggles, lighters, hose, and asbestos paper. Rods and supplies may be ordered from Linde or from automotive and industrial jobbers.



GENERATORS AND MANIFOLDS

OXWELD acetylene generators are made for both portable and stationary use — with maximum generating capacities of from 30 to 9,000 cu. ft. per hour. OXWELD manifolds centralize the oxygen and acetylene supply from cylinders.

OXYGEN, ACETYLENE, CARBIDE

A booklet describing use of LINDE oxygen, PREST-O-LITE acetylene, UNION carbide, and OXWELD apparatus in these and other processes will be sent without charge on request. Ask for Form 5268A.

BUY UNITED STATES WAR BONDS AND STAMPS

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

30 E. 42nd St., New York 17, N. Y. UCC Offices in Other Principal Cities

In Canada: Dominion Oxygen Company, Limited, Toronto

The words "Linde," "Prest-O-Lite," "Union," "Oxweld," "Purox," "Prest-O-Weld," "Haynes Stellite" and "Unionmelt" are trade-marks of Union Carbide and Carbon Corporation or its Units.

NICKEL AIDS THE MACHINE TOOL INDUSTRY

to KEEP 'EM WORKING!

Everyone marvels at the speed of American production for war . . .

But how many realize that much of the credit should go to machine tool designers?

They are the ones who created the *tools* for doing the job.

They're making production miracles commonplace . . . with the most efficient machine tools that ever whipped raw material into finished product.

And the secret? For one thing, they try to design each component part of a machine so that it outlasts the machine itself.

They know that failure of a single machine in a mass production setup might bring whole assembly lines to a stop.

So they lean heavily on Nickel alloyed materials for the critical parts of machine tools.

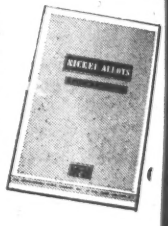
Over the years they have learned that Nickel contributes toughness, strength, and fatigue resistance . . . properties vitally essential to many different kinds of tool parts . . . from grinder frames to tail shafts, from gears and spindles to drill chucks and lathe beds.

In the industries which use machine tools, it's an axiom that "a little Nickel goes a long way" to keep 'em working.

Whatever *your* industry may be . . . if you want help in the selection, fabrication, and heat treatment of alloys . . . we offer you counsel and data.

New Catalog Index

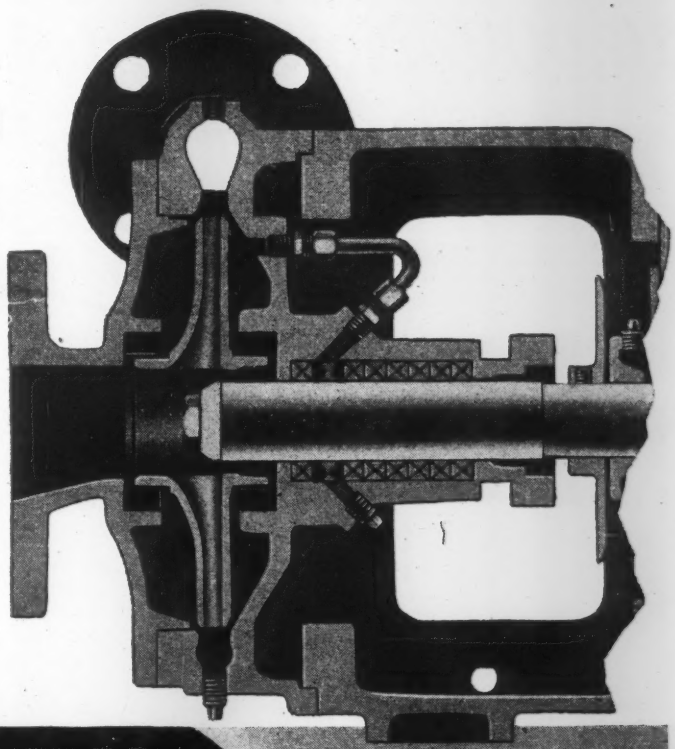
New Catalog C makes it easy for you to get Nickel literature. It gives you capsule synopses of booklets and bulletins on a wide variety of subjects — from industrial applications to metallurgical data and working instructions. Why not send for your copy of Catalog C today?



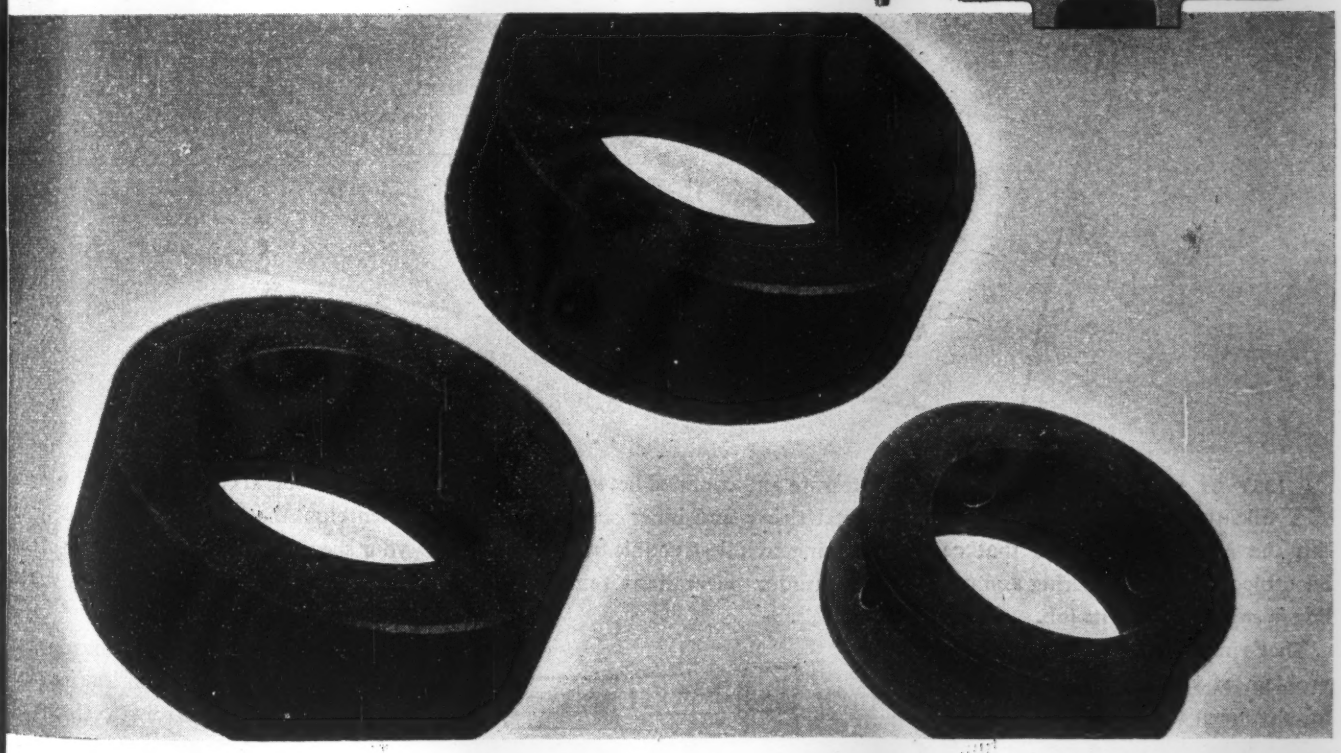
* Nickel *

THE INTERNATIONAL NICKEL COMPANY, INC., *67 Wall St., New York 5, N.Y.*

GRAPHITAR (CARBON-GRAPHITE) — THE TRIED AND PROVEN MATERIAL FOR CENTRIFUGAL PUMP WEARING AND LANTERN RINGS



You will note in the accompanying cross-section view of a centrifugal pump the position of the Graphitar wearing rings and lantern rings. Graphitar parts have greatly reduced the maintenance problem in centrifugal pumps. Neither high speed nor high temperatures affect Graphitar. Up to 3500 p.s.i. at 400°F. Graphitar lubricates itself. And Graphitar parts are not affected by water, gasoline, acids or chemicals of any kind.



Chemically inert, as well as mechanically strong, Graphitar parts are proving successful for such varied applications as drop tight seals, fluid coupling seals, pistons, liners, piston rings and clutch release bearings. Graphitar does not warp or distort. Graphitar parts can be moulded into a wide variety of shapes and finish-ground to extremely close limits. In certain grades and forms, Graphitar has a transverse breaking strength of 35,000 p.s.i.

If you manufacture a product requiring parts with the characteristics of Graphitar, it will pay you to mail data about your product to our engineers here in Saginaw. Write today for new 20-page book of facts about Graphitar.

GRAPHITAR
(CARBON-GRAPHITE)

THE UNITED STATES GRAPHITE COMPANY • SAGINAW, MICHIGAN

10,000 New Products Can Be Improved with Rubber Engineered by General*

*Estimate, of course. But any product that moves or needs insulation against vibration needs The General Silentbloc!

GENERAL SILENTBLOC *Mountings and Bearings can...*

—Lengthen motor life by damping vibration

—Insulate instrument panel against foreign vibration

—Correct for misalignment of long-shaft supports

—Absorb shock loads on any type of gear

—Decrease noise in business machines

—Protect electronic tubes from vibration

—Cut worker-fatigue from pneumatic hand tools

—Guard against chain breaks by absorbing shock loads

—Give controlled torque action in shaker screens or other oscillating equipment

—Cut floor vibration from presses and shears

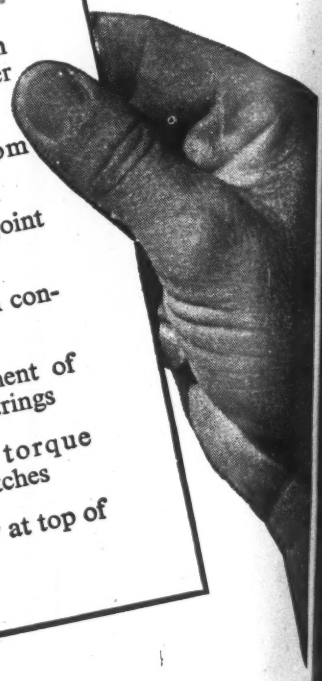
—Provide oil-free torque joint for food machinery

—Cushion shock loads on conveyor system rollers

—Correct for misalignment of needle and ball bearings

—Give service-free torque action on rail switches

—Absorb conical play at top of textile bobbins



A LIST of uses for the General Silentbloc could go on and on. But the important point is that each Silentbloc mounting, bearing and coupling is *engineered* for its job.

That's important to you in solving any problem of vibration, torque action or misalignment in your new products.

The Silentbloc is not just "a hunk of rubber." It is an engineered articulating joint made by a patented principle which gives exact control of performance. The ring of rubber is elongated under high pressure and confined between the outer metal sleeve and inner sleeve or shaft, forming an indestructible bond. The rubber, under permanent tension, stays "alive".

Before Assembly — After Assembly

By varying the size and design of the Silentbloc, the elongation and distortion of the rubber and the modulus of the rubber, General engineers can give you a Silentbloc that conforms precisely to your specification. It can be made of any metal, any type of rubber, in any size to support ounces to tons.

The Silentbloc has been proved in use on automotive, industrial, marine, and home machinery, aircraft, electrical equipment and many other products. *It can improve your products.* Write for factual Silentbloc booklet. The General Tire & Rubber Company, Dept. 73, Wabash, Indiana.

Shear-type Silentbloc mount to damp motor vibration or insulate tubes and controls from foreign vibration.

Silentbloc bushing to correct for misalignment in bearing or shaft supports.

Silentbloc mounting to isolate vibration between parts of a machine or moving assembly.

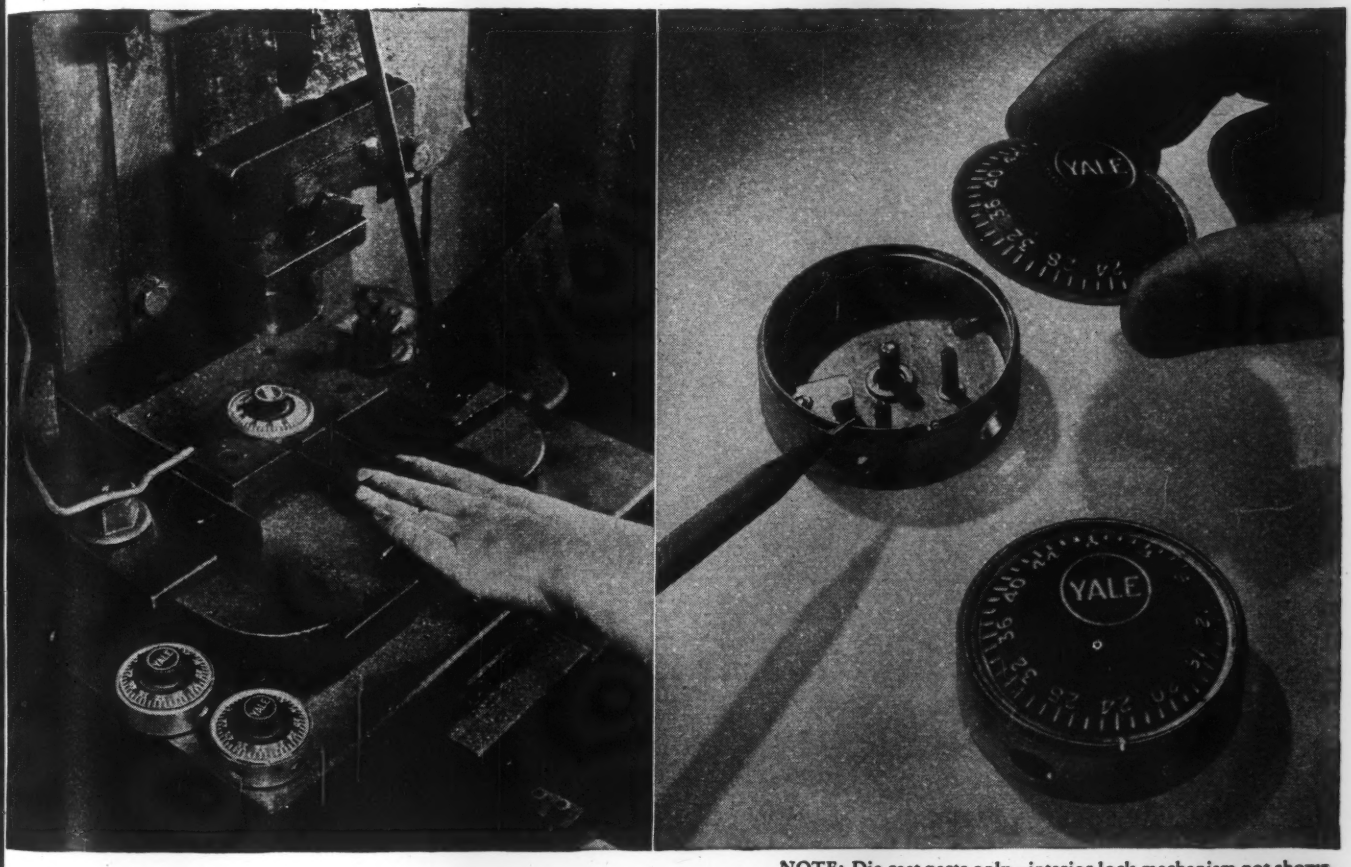
THE GENERAL TIRE & RUBBER CO.

Mechanical Goods Division, Wabash, Indiana

The GENERAL SILENTBLOC
MOUNTINGS . . . BEARINGS
COUPLINGS

DUCTILITY!

—2 ZINC ALLOY DIE CASTINGS ASSEMBLED BY "CURLING"—AT THE RATE OF 375 AN HOUR!



NOTE: Die cast parts only—interior lock mechanism not shown.

The ductility of zinc alloy die castings was not the determining factor in their adoption for the keyless (combination) padlock shown above. Economy, appearance* and accuracy gave the call to this metal and method of production. But ductility provides a "plus" advantage in the low cost assembly of the lock dial by a simple "curling" operation.

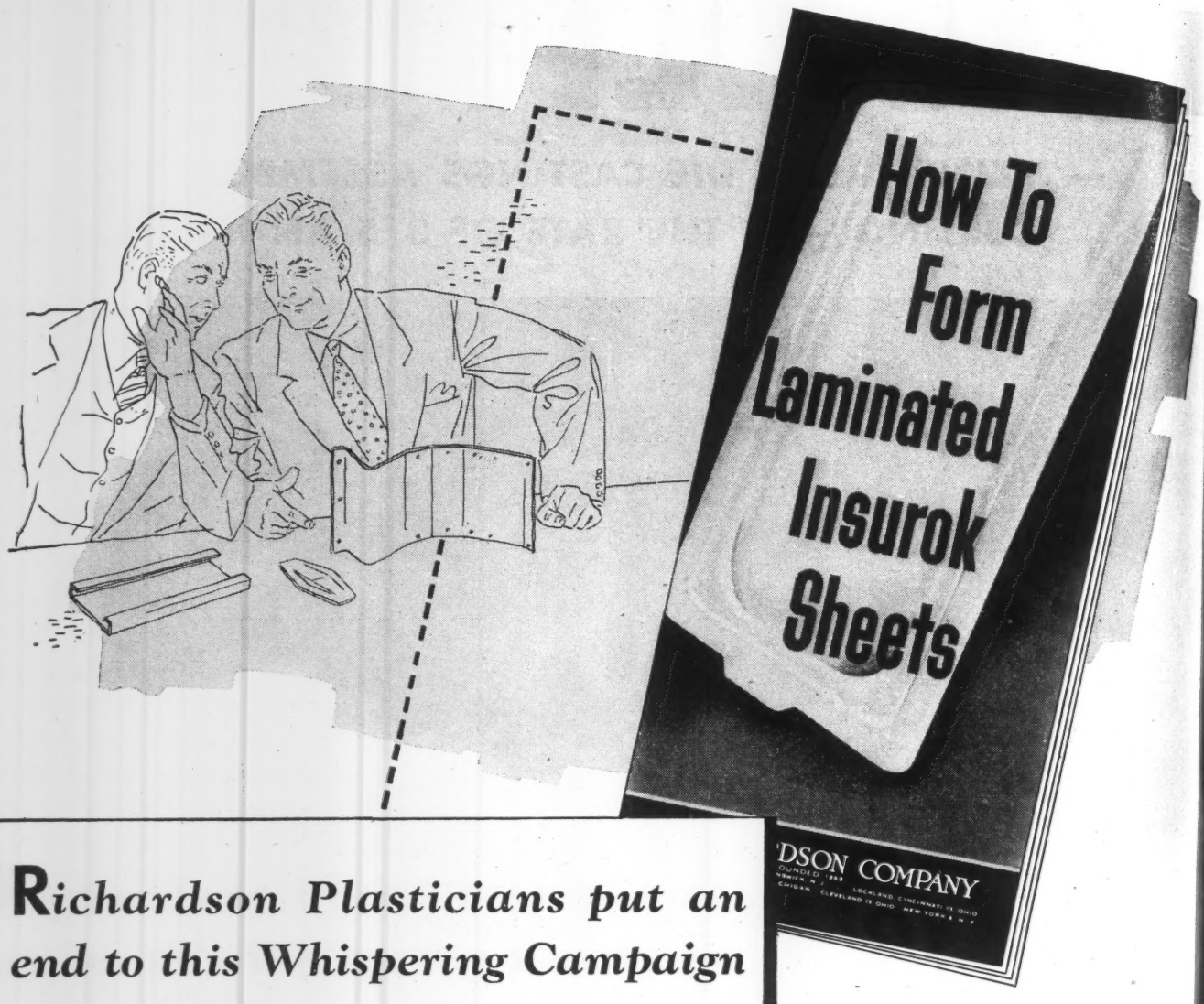
The die cast dial, with a slightly larger sheet metal disk fastened to its under side, is set into the cylindrically shaped die casting which is provided with a shoulder to support the disk. One strike of the punch in a press (above left) and the thin lip of the cylindrical casting is neatly curled over the disk. Thus the disk is locked between the shoulder and the curled-in lip, permitting the dial to be rotated but not pulled out.

Ductility is just one of the many physical and mechanical advantages that make die castings of zinc alloy the most widely used under normal conditions. *Every die casting company is equipped to make zinc alloy die castings,* and will be glad to discuss their advantages with you—or write to The New Jersey Zinc Company, 160 Front Street, New York 7, New York.

* The clean-cut figures and graduations are cast-in on the dial.

ZINC
FOR DIE CASTING ALLOYS

The Research was done, the Alloys were developed, and most Die Castings are specified with
HORSE HEAD SPECIAL (99.99+% Uniform Quality) ZINC



Richardson Plasticians put an end to this Whispering Campaign

They've taken the mystery out of forming Laminated INSUROK plastic sheets! For actually it is a simple process . . . one you can do yourself if you *know how.* And here is a small booklet that puts you in the know . . . the A B C's of how to form laminated plastic sheets yourself.

It is as easy as this:

A. HEAT the laminated sheet uniformly slightly below the blistering point.
B. INSERT the heated sheet in the forming fixture and apply pressure.
C. ALLOW part to cool and then remove.

Result . . . the shape is now permanent.

Laminated INSUROK plastic sheets for forming have varied uses. They combine strength with lightness . . . are resistant to sudden changes in temperature . . . withstand the destructive actions of most chemicals, reagents, and solvents.

Write today for the booklet that tells all about forming laminated plastic sheets . . . "*HOW TO FORM LAMINATED INSUROK SHEETS.*" It's FREE for the asking. Send for it on your company letterhead.

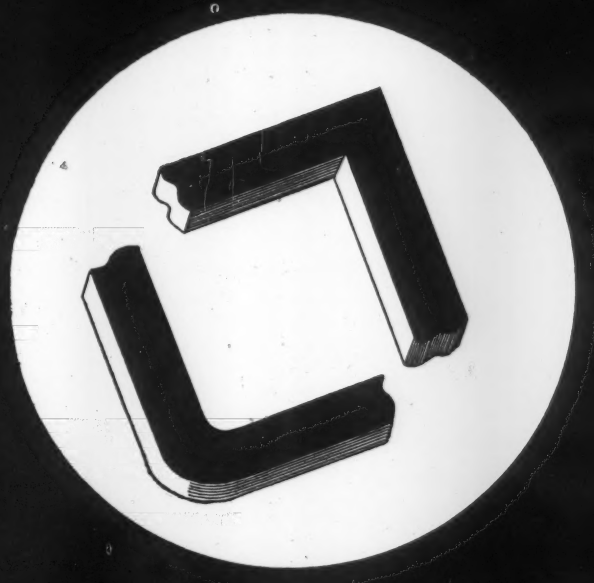
You may prefer to have the forming done for you. If so, the working knowledge and years of practical experience of Richardson Plasticians are at your disposal.

INSUROK *Precision Plastics*

The RICHARDSON COMPANY

MELROSE PARK, ILL. NEW BRUNSWICK, N. J. FOUNDED 1868 INDIANAPOLIS 1, IND. LOCKLAND, CINCINNATI 15, OHIO
DETROIT OFFICE: 6-252 G. M. BUILDING, DETROIT 2, MICHIGAN NEW YORK OFFICE: 75 WEST STREET, NEW YORK 6, N. Y.
CLEVELAND OFFICE: 326-7 PLYMOUTH BLDG., CLEVELAND 15, OHIO

BETTER STEEL CASTINGS THROUGH RESEARCH



Where Shape means Strength

The "wiry" man, with sloping shoulders and stringy muscles is often a much more efficient worker than the squarely-built, bulky fullback.

Shape contributes more to strength and stamina than mere bulk—in both men and steel castings.

Steel foundry technicians have learned the principles of sound steel casting design through painstaking study, through infinite trial and error, through broad experience.

Those are the elements of organized research that tell us how to make steel castings stronger and better. For instance, illustrated here is one of the simplest principles of design. The rounded-corner section is much better than the square section—functionally and production wise. Many such basic principles have been established.

Through research, we know more about directional solidification, scientific weight distribution, elimination of points of weakness—resulting in stronger, better castings.

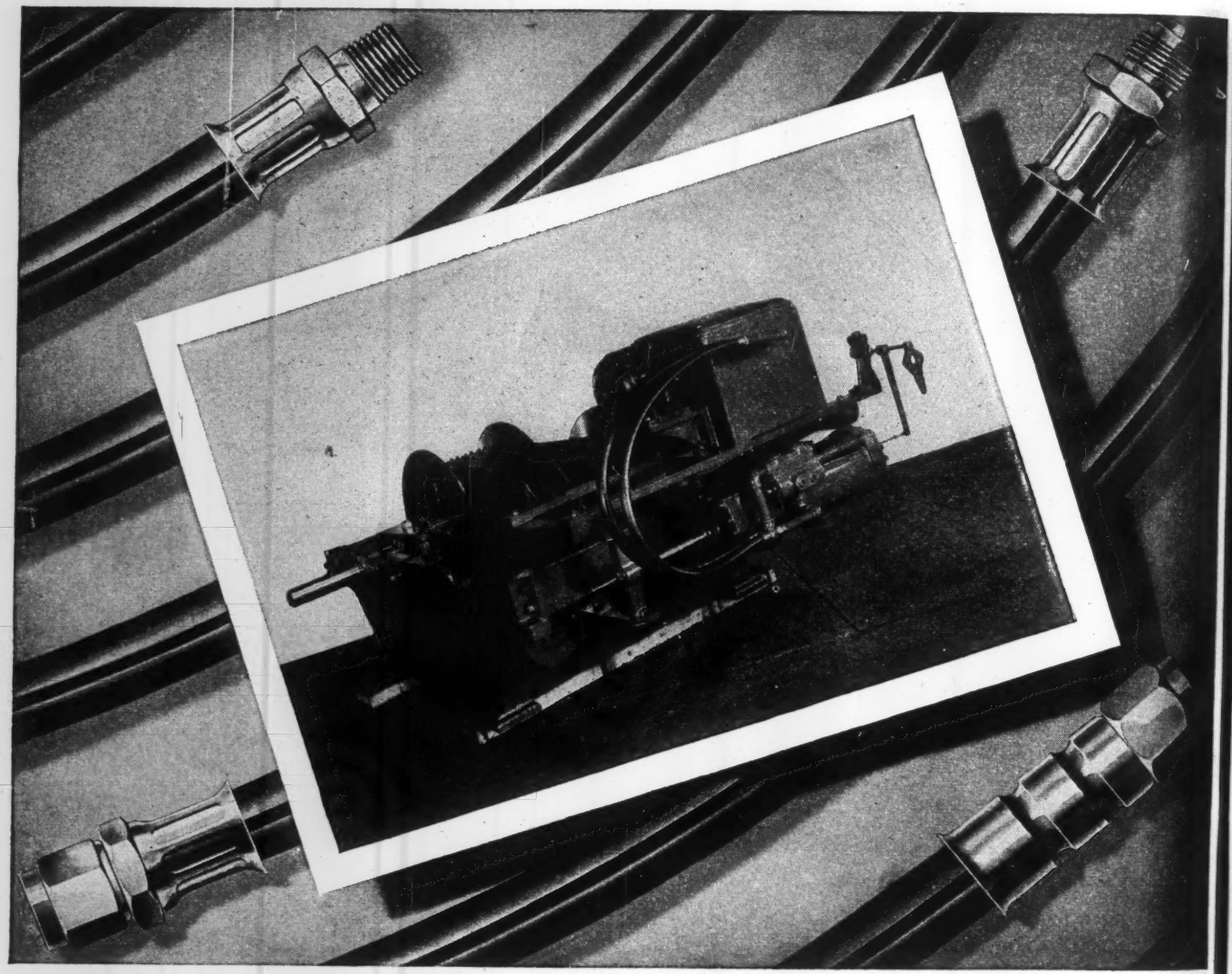
Thousands of manufacturers are right now planning the things they will make when their war job is completed—the newer and better goods of peace.

The Steel Foundry Industry wants to be a part of this future planning. Through its extensive research on design, explained in detail in the Steel Casting's Handbook, this Industry can contribute a great deal toward producing better tools, better appliances, better machines—often at costs that will help to meet strenuous postwar competition.

Published by the Steel Founders' Society of America, to tell you about its organized Research Program.

MODERNIZE AND IMPROVE YOUR PRODUCT WITH

STEEL CASTINGS



Meet the longest-lasting flexible oil line **REEVES** *ever used...*

Even under the worst physical stress . . . even carrying the most corrosive organic solvents or oils, tough, flexible Resistoflex hose assemblies do not gum or erode, cause no clogging of fine hydraulic orifices . . . give year-in-year-out, trouble-free service. Reeves Pulley Co. knows this. On their Variable Speed Units Resistoflex lines have outlasted all predecessors, improved performance, lowered maintenance cost.

Resistoflex lines are *entirely* unaffected by fuels, oils and almost every organic solvent used in industry. They withstand severe and prolonged vibration, torsion, flexing and aging.

SEND FOR CATALOG

Write for your copy of the Resistoflex Industrial Catalog. This booklet describes all types of Resistoflex industrial hose and hose assemblies.

THE COMPAR TUBE IS THE HEART OF THE HOSE

RESISTOFLEX FEATURES:

NON-CLOGGING—Resistoflex hose does not gum, never clogs hydraulic or lubrication systems, diesel injector nozzles or other fine orifices.

PERMANENT, FULL FLOW—Chemically inert, glass-smooth inner surface provides permanent free flow—eliminates turbulence and skin friction.

FLEXIBLE, VIBRATION PROOF—Tens of thousands of simultaneous flexings and twistings have no effect on Resistoflex lines.

STRONGER—Resistoflex hose assemblies provide greater tensile strength than similar lines of equivalent size and construction.

HOSE AND HOSE ASSEMBLIES FOR HYDRAULIC OILS AND VACUUM, FUELS AND LUBRICANTS, ORGANIC SOLVENTS, PAINTS AND LACQUERS, THINNERS, REFRIGERANT, NATURAL AND MANUFACTURED GASES—LABORATORY TUBING—DIPPED AND MOLDED MECHANICAL GOODS—COATINGS. SOLUTIONS AND PROTECTIVE CLOTHING.

RESISTOFLEX

RESISTOFLEX CORPORATION, BELLEVILLE, NEW JERSEY

Assuring *Free and Easy* traverse for a TANK TURRET

Accurate finishing in a fully equipped and highly modern machine shop (a good example of its facilities is the 20′ vertical boring mill above) is only one of the advantages PSF offers to users of steel castings. Back of that is long experience and advanced technique in everything from melting to heat treating, and the ability to handle any size or shape in carbon, alloy or armor steel. Let us work with you on your plans.

46 YEARS OF STEEL CASTING KNOWLEDGE

Pittsburgh

STEEL FOUNDRY CORPORATION

GLASSPORT, PA.

Sales Offices: NEW YORK • PHILADELPHIA • WASHINGTON AND CHICAGO

ARMSTRONG'S SEALING MATERIALS

SC-601

CHARACTERISTICS OF SC-601

Composition

Thiokol and granulated cork

Physical Properties

Compressibility

Resilience

Low volume increase in oils and most solvents

Imperviousness to common liquids and gases

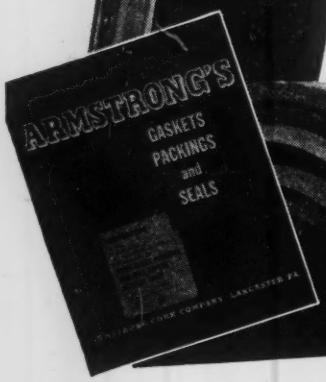
The cork content of SC-601 substantially reduces the tendencies of the synthetic to side-flow and to stick to metal

Typical Uses

Valve seats for gasoline dispensing equipment and for paint and lacquer sprayers; gaskets for containers and other units handling such liquids

Available Forms

Sheets *Die-cut parts* *Molded shapes*

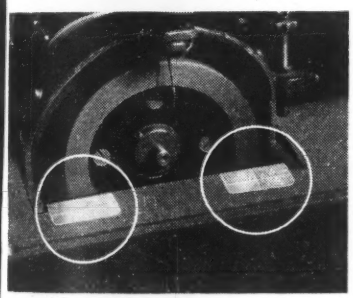


SC-601 is one of more than fifty sealing materials developed by Armstrong. For descriptions of these materials, see Sweet's File for Product Designers. Or write for your free copy of Armstrong's informative, illustrated booklet, "Gaskets, Packings, and Seals." Armstrong Cork Co., Gasket and Packing Department, 5110 Arch St., Lancaster, Pa.

ARMSTRONG'S
GASKETS · SEALS · PACKINGS

Cork Compositions • Cork-and-Synthetic-Rubber Compositions
Synthetic Rubber Compounds • Cork-and-Rubber Compositions
Fiber Sheet Packings • Rag Felt Papers • Natural Cork

5 CASES WHERE KENNAMETAL INSERTS *Take a licking and like it!*



CASE No. 1

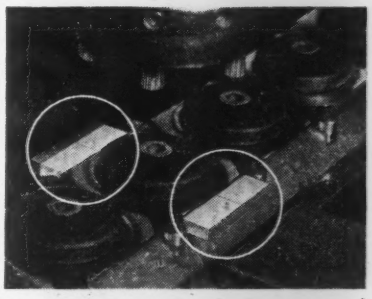
Condition: Grinder table had to be resurfaced frequently to maintain true grinding of tool angles.

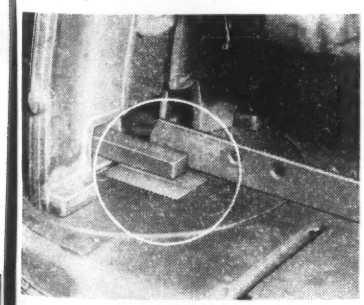
Correction: Kennametal inserts provide true, flat surfaces that show no appreciable wear after many months' service.

CASE No. 4

Condition: Wire cleaning brushes cut deep into steel leveling guides in less than one day.

Correction: Kennametal inserts resist the abrasion . . after month's service, are still in good shape.





CASE No. 2

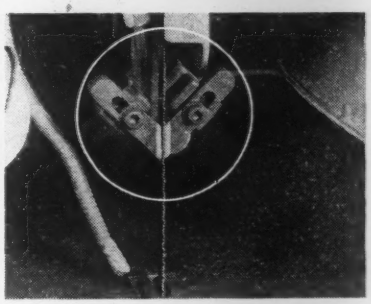
Condition: Worn sliding surfaces of abrasive saw rest allowed shank steel to wobble, causing uneven cut-off.

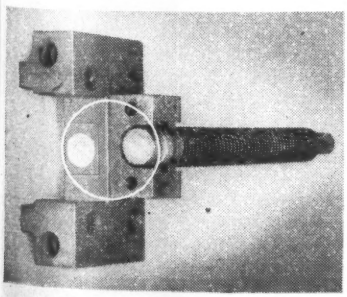
Correction: Inserts of Kennametal make smooth surface that outwears steel up to 100 times.

CASE No. 5

Condition: Steel surfaces of band saw guides wore quickly, allowing saw to weave and cause uneven profiling.

Correction: Inserts of wear-resistant Kennametal provide non-galling surfaces that guide the saw straight and true.





CASE No. 3

Condition: Steel parts of vise clamping mechanism badly galled by twisting action.

Correction: Kennametal discs, at abutting points, minimize wear; permit jaw to be closed securely, opened readily, with less effort.

WHAT'S YOUR CASE?

If the service life of your products or production machinery is shortened by excessive wear . . . incorporate extremely hard, non-galling Kennametal parts at critical points. Kennametal is available in a variety of standard shapes (balls, discs, flat blanks), and it can be molded into almost any special form, limited only by reasonable proportions. Write for catalog information.

KENNAMETAL

SUPERIOR CEMENTED CARBIDES

KENNAMETAL Inc., LATROBE, PA.

Is this your problem? *Superior* engineers will be glad to help you "work it out" — by "working in" Magnesium Castings. Write today. No obligation.

Superior Bearing Bronze Co., Inc.

MAGNESIUM DIVISION • 151 BANKER ST. • BROOKLYN 22, N. Y.

MAGNESIUM CASTINGS TO MEET U. S. ARMY & NAVY SPECIFICATIONS

LADISH

QUALITY FORGINGS

THERE IS NO SUBSTITUTE FOR *Quality Control*

New forging techniques—especially in the field of heavy drop forgings—afford greater latitude in design.

Our engineers are available now for consultation on your postwar products.

DROP FORGINGS UP TO 1,800 lbs.

HAMMERED FORGINGS UP TO 10,000 lbs.

TO MARK PROGRESS

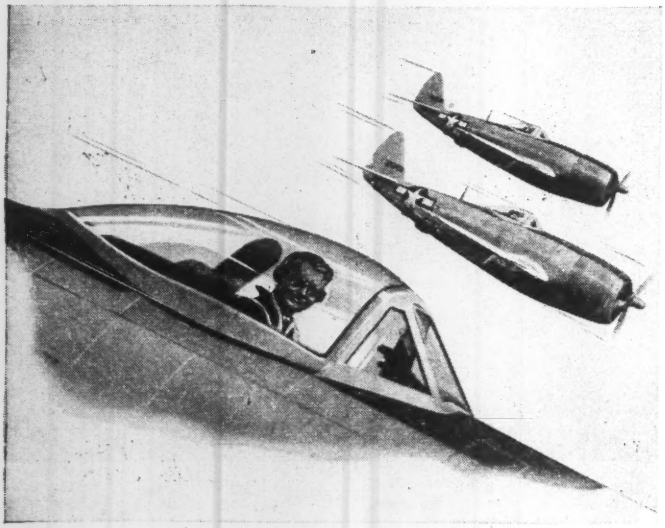
ARMY NAVY

LADISH DROP FORGE CO.

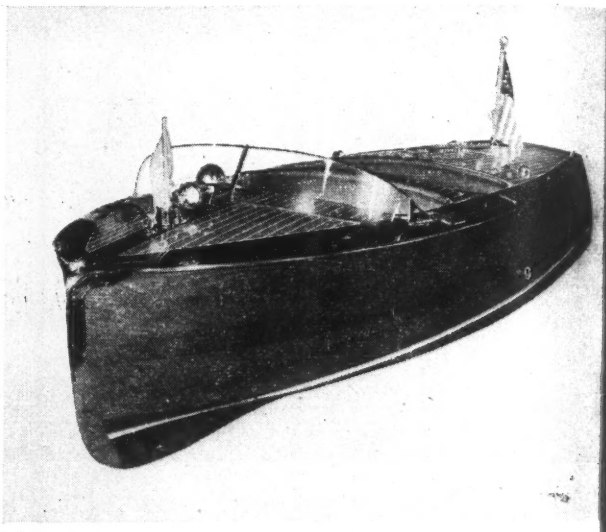
CUDAHY • WISCONSIN

MILWAUKEE SUBURB

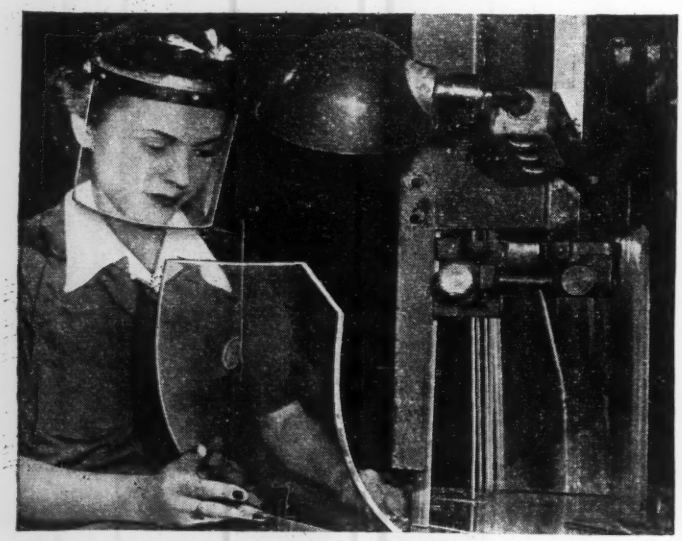
Plexiglas – *the plastic tha*



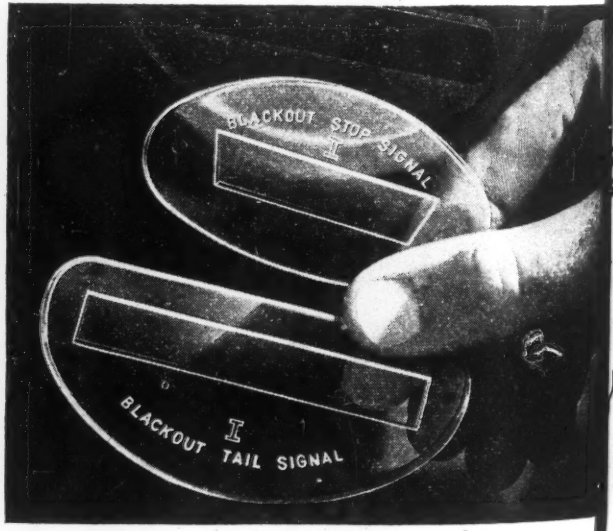
The high strength of PLEXIGLAS permits its fabrication into large unsupported structures which are subjected to severe stresses in service. A typical instance is the one-piece "bubble" canopy that protects the pilot on the Republic Thunderbolt.



Used in spray shields, windows, and light covers on boats, PLEXIGLAS withstands the weaving and stresses of the superstructure in heavy seas. Unaffected by salt water, sunlight and weathering, PLEXIGLAS retains its high transparency indefinitely.



In this safety shield PLEXIGLAS provides high impact strength, and is proof against splintering when struck by flying chips of metal. With its high transparency, PLEXIGLAS permits clear, unobstructed vision, together with excellent protection for the worker.



PLEXIGLAS molded parts successfully absorb repeated impacts and flexing, even when subjected to such severe service as these black-out lenses, which are used on Army trucks that must move rapidly over rough terrain.

ROHM & HAAS C

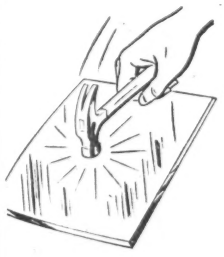
Manufacturers of Chemicals including Plastics . . . Synthetic Insecticides . . . Fungicides

...combines Transparency with Strength

THE permanent crystal-clarity of PLEXIGLAS naturally suggests its adoption in a wide variety of industrial products and parts where transparency is necessary—or desirable.

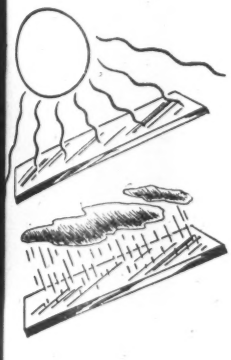
Equally important to the product designer are the excellent mechanical properties of this Rohm & Haas acrylic plastic—fully demonstrated properties which assure its successful performance in the fields of application opened by its transparency.

1. Impact strength of PLEXIGLAS is exceptionally high



The ability of PLEXIGLAS to withstand severe impact is of particular value in applications where breakage would be costly, inconvenient or hazardous. When held rigidly and subjected to heavy blows, PLEXIGLAS does break, but only into large, dull-edged pieces.

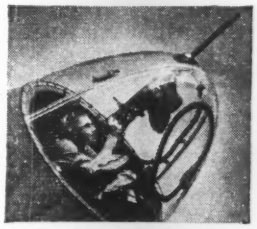
2. PLEXIGLAS has lasting strength



The excellent mechanical properties of PLEXIGLAS—like its transparency—are permanent, practically unaffected by extended flexing, weathering, low temperature or water immersion. New heat resistant formulations have recently increased the service temperature range for PLEXIGLAS parts.

3. Rigidity permits use of PLEXIGLAS in self supporting parts

PLEXIGLAS is flexible, but its modulus of elasticity is high enough (3 to 4 x 10^5) so that it can be used in secondary or self-supporting structures and housings. Among thermoplastics PLEXIGLAS also is exceptional in its low cold flow or creep.



LOOKING AHEAD THROUGH

Plexiglas

Rohm & Haas is the pioneer and principal producer of acrylic plastics. Today PLEXIGLAS is found on every type of Army and Navy plane—convincing proof of the qualities that have made it "aviation's standard transparent plastic."

Why not investigate the ways in which it can give *your* product new sales advantages? Write or call our nearest office—Philadelphia, Detroit, Los Angeles, Chicago, Cleveland, New York. Canadian Distributor, Hobbs Glass Ltd., Montreal.

Only Rohm & Haas makes

PLEXIGLAS

CRYSTAL-CLEAR ACRYLIC SHEETS AND MOLDING POWDERS*

*Formerly CRYSTALITE Molding Powders

PLEXIGLAS is the trade-mark, Reg. U. S. Pat. Office, for the acrylic resin thermoplastic sheets and molding powders manufactured by Rohm & Haas Company.

Represented by Cia. Rohm y Haas, S. R. L. Carlos Pellegrini 331, Buenos Aires, Argentina, and agents in principal South American cities.

COMPANY

WASHINGTON SQUARE
PHILADELPHIA 5, PA.

Enzymes . . . Chemicals for the Leather, Textile, Enamelware, Rubber and other Industries

BEFORE YOU PICK

YOUR POSTWAR REFRIGERATOR FINISH • • •

"The Facts on Polymerin" describes the competitive advantages that Polymerin*-finished products will have in postwar markets. Industry asked us to develop this new type of finish. You said, "Give me a finish that dries with the speed of lacquer to a film that has the hardness and durability of enamel!"

The answer is Polymerin, an organic speed-bake enamel with unusual properties of durability and resistance . . . and these qualities may be varied to meet the requirements of specific products. Polymerin for refrigerators is formulated with particular emphasis on lustrous, non-yellowing appearance and maximum resistance to grease and humidity. In the pre-war bicycle industry, baking schedules as low as two minutes in the hot zone were made possible by the fast drying qualities of Polymerin; and its characteristics of mar-, scratch-, and abrasion-resistance have fitted it ideally for this application.

"The Facts on Polymerin" tells *how* and *why* Polymerin has been used in nine leading industries. This is information you will want to have before you specify a finish for your postwar products—and it is yours for the asking! Use the coupon below and a copy of "The Facts on Polymerin" will be mailed to you promptly, without obligation. Why not fill in the coupon right now?

POLYMERIN

The Original Speed-bake Finish

A PRODUCT OF AULT & WIBORG
DIVISION OF INTERCHEMICAL CORPORATION

Buy More Bonds

READ THIS BOOK

F-1

Ault & Wiborg *Division of Interchemical Corporation, Empire State Building, New York 1, N.Y*

Please send, without obligation, a free copy of the "Facts on Polymerin".

*Name*_____

*Company*_____

*Address*_____

**Reg. U.S. Pat. Off.*

PRECISION-FABRICATED TO 3 DECIMAL TOLERANCES

Final Inspection — Micrometer indicators used to compare finished PANELYTE Barrel Support Block with metal template upon which test block is mounted.

PANELYTE* Propeller Barrel Support Blocks Stand Grueling Strain Without Deflection!

Vertical Milling — 3" and ¾" radii on PANELYTE Barrel Support Block milled to tolerance of ± .001" as curved surface must fit exactly to inside barrel contour.

Mass-produced from strong, fabric base PANELYTE — Barrel Support Blocks transmit heavy loads from the barrel to the spider of the Hamilton Standard Propeller used on bomber and fighter planes. Precision-fabrication is essential to assure accuracy of part — and exact balance in delicately adjusted assembly.

Manufacturing tolerances on length of support seat (cut-out section) in PANELYTE Barrel Support Block and on outside radius, which mates with barrel, are held to a total variation of .003" + .001" and — .002". Twelve different machining operations, including band sawing, grinding, sanding, drilling, counterboring and milling, are employed in the precision-fabrication of this intricate part. Rapid mass production is possible through new machining techniques and the enlarged facilities of the PANELYTE Plant.

The ready adaptability of PANELYTE to fine machining, dimensional stability — and economy — highly recommend it for structural parts of complicated design. Our engineering staff will be glad to explain how Precision-Fabrication guarantees accuracy in the most intricate of parts — often saves man-hours and money in production.

Write for factual "Data Book"

PANELYTE *the structural plastic*

PANELYTE DIVISION
ST. REGIS PAPER COMPANY
230 PARK AVENUE
NEW YORK 17, N. Y.

Sales Offices: Atlanta, Boston, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Kansas City, Los Angeles, Mexico City, Montreal, New Orleans, St. Louis, St. Paul, San Francisco, Seattle, Syracuse, Toronto, Trenton, Vancouver

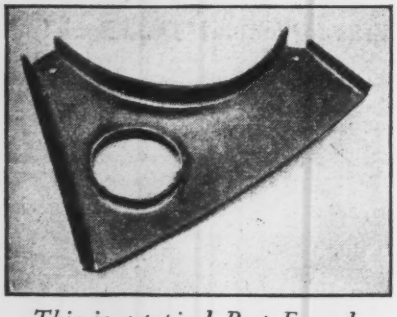
* Reg. U. S. Pat. Off.

MASS PRODUCTION OF SHEETS, RODS, TUBES, MOLDED FORMS AND FABRICATED PARTS IN PAPER, FABRIC, WOOD VENEER, FIBRE GLASS AND ASBESTOS BASE LAMINATES

POST FORMED PHENOLITE*

Opens wide avenues for your successful Post-War Products

*A formable thermosetting sheet material—makes parts more resistant to shock



This is a typical Post Formed Phenolite baffle used in aircraft construction.

Post Formed Phenolite parts are playing an important role in today's airplane construction because of their ability to withstand tremendous impact without fracture. This impact strength is approximately ten times that of usual molded parts.

This remarkable property, combined with Phenolite's other exceptional characteristics—resistance to wear and moisture, light weight (about one-half the weight of aluminum), excellent electrical insulator—recommends the broad advantageous use of Post Formed parts in countless peacetime products.

Post Formed Phenolite Parts are economical to produce. The sheet is heated to forming temperature (a matter of seconds). After heating, it is formed in an inexpensive wooden mold with standard press equipment. Practically any desired form or shape may be achieved. Forming takes place in a few minutes. There are no rough edges to be sanded—no flash to be removed. Fabrication may be done before or after forming.

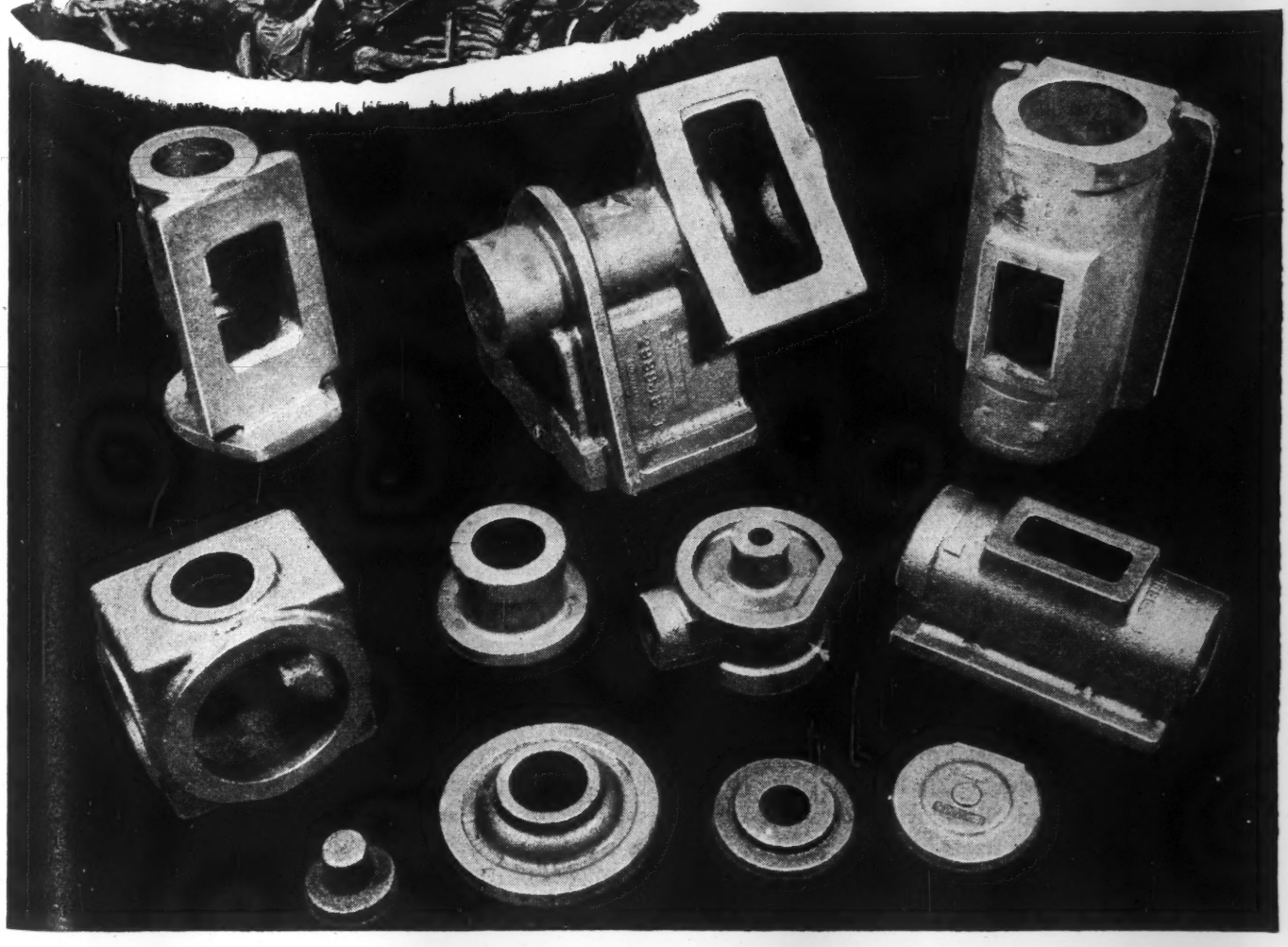
Just now we can supply material for war applications only, but our technical men will be glad to work with your engineers on your peacetime projects. Write us now on Post Formed Phenolite.

NATIONAL VULCANIZED FIBRE CO.

Wilmington, Delaware ***Offices in Principal Cities***

Bofors Guns

BUILT WITH UNITCASTINGS



● British success in using Bofors guns against low-flying planes has made this weapon popular with American armed forces. Highly accurate—they fire 120 rounds per minute.

Fast-firing performance puts a terrific strain on every part in the Bofors gun. Some of these parts—such as the gear casings shown above—are UNITCASTINGS!

Whether it's steel castings for the mechanized fighting units of today... or for the improved machines and products of tomorrow... Unitcast *pours 'em right* for automatically controlled Quality and Uniformity!

Unitcast Corporation.... Toledo, Ohio.

UNITCAST CORPORATION

ALLOY AND CARBON ELECTRIC STEEL CASTINGS

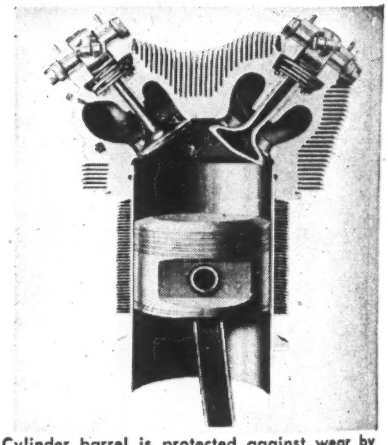
THERE'S A CLUE FOR YOU BEHIND THE RECORD-BREAKING PERFORMANCE OF "OLD 49"

Breaking all records for sustained performance, four Wright Cyclone engines in the Boeing B-17 Flying Fortress "Old 49" have flown 1,134 hours and 15 minutes without overhaul. This accomplishment is equivalent to flying approximately 200,000 miles, *eight times around the world* at the equator, or more than 47 full days of time in the air. And it stamps "proof of performance" on the men who designed and built and maintained these engines, *and on the materials used.*

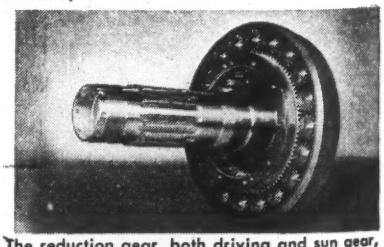
Nitrided Nitralloy one of the hardest steel surfaces known, was used at various places in these engines. The cylinder barrels, reduction gear—both driving and sun gear, and many other parts of the engine were made from Nitralloy.

Where surfaces must be extremely hard to resist spalling, and core strength is of vital importance, it will pay you to specify and use Nitrided Nitralloy. Nitriding is the process of case hardening certain alloy steels by means of a nitrogenous medium, such as ammonia gas. The alloy steels that are most suitable for Nitriding are known as Nitralloy.

Nitralloy Steels are available under government regulation where they will aid the war effort. Write for details.



Cylinder barrel is protected against wear by Nitralloy.



The reduction gear, both driving and sun gear, are made from Nitralloy. This gear has teeth slightly more than one inch wide and transmits the full 1200 h. p. from the crankshaft to the propeller shaft.

THE NITRALLOY CORPORATION
230 PARK AVENUE
NEW YORK 17, N. Y.

Companies Licensed by The Nitralloy Corporation

Allegheny Ludlum Steel Corp.	Watervliet, N. Y.
Bethlehem Steel Co.	Bethlehem, Pa.
Copperweld Steel Co.	Warren, O.
Crucible Steel Co. of America	New York, N. Y.
Firth-Sterling Steel Co.	McKeesport, Pa.
Republic Steel Corporation	Cleveland, O.
The Timken Roller Bearing Co.	Canton, O.
Rotary Electric Steel Co.	Detroit, Mich.
Vanadium-Alloys Steel Co.	Pittsburgh, Pa.
Atlas Steel Limited	Welland, Ontario

Operating & Accredited Nitriding Agents

Commercial Steel Treating Corp.	Detroit, Mich.
Englehard & Kenny	North Arlington, N. J.
The Lakeside Steel Improvement Co.	Cleveland, O.
Lindberg Steel Treating Co.	Chicago, Ill.
Link-Belt Co.	Philadelphia, Pa.
Met-Lab, Inc.	Philadelphia, Pa.
New England Metallurgical Corp.	Boston, Mass.
Pittsburgh Commercial Heat Treating Co.	Pittsburgh, Pa.
Queen City Steel Treating Co.	Cincinnati, O.
Rex & Erb	Lansdale, Pa.
The Salkover Metal Processing Co., Inc.	Long Island City, N. Y.
Wesley Steel Treating Co.	Milwaukee, Wis.
N. A. Woodworth Co.	Ferndale, Mich.
Ontario Research Foundation	Toronto, Ontario, Can.

Manufacturers of Nitralloy Steel Castings

Milwaukee Steel Foundry Div., Grede Foundries, Inc.	Milwaukee, Wis.

Warehouse & Stock

A. Milne & Co.	New York, N. Y.

"Standard"

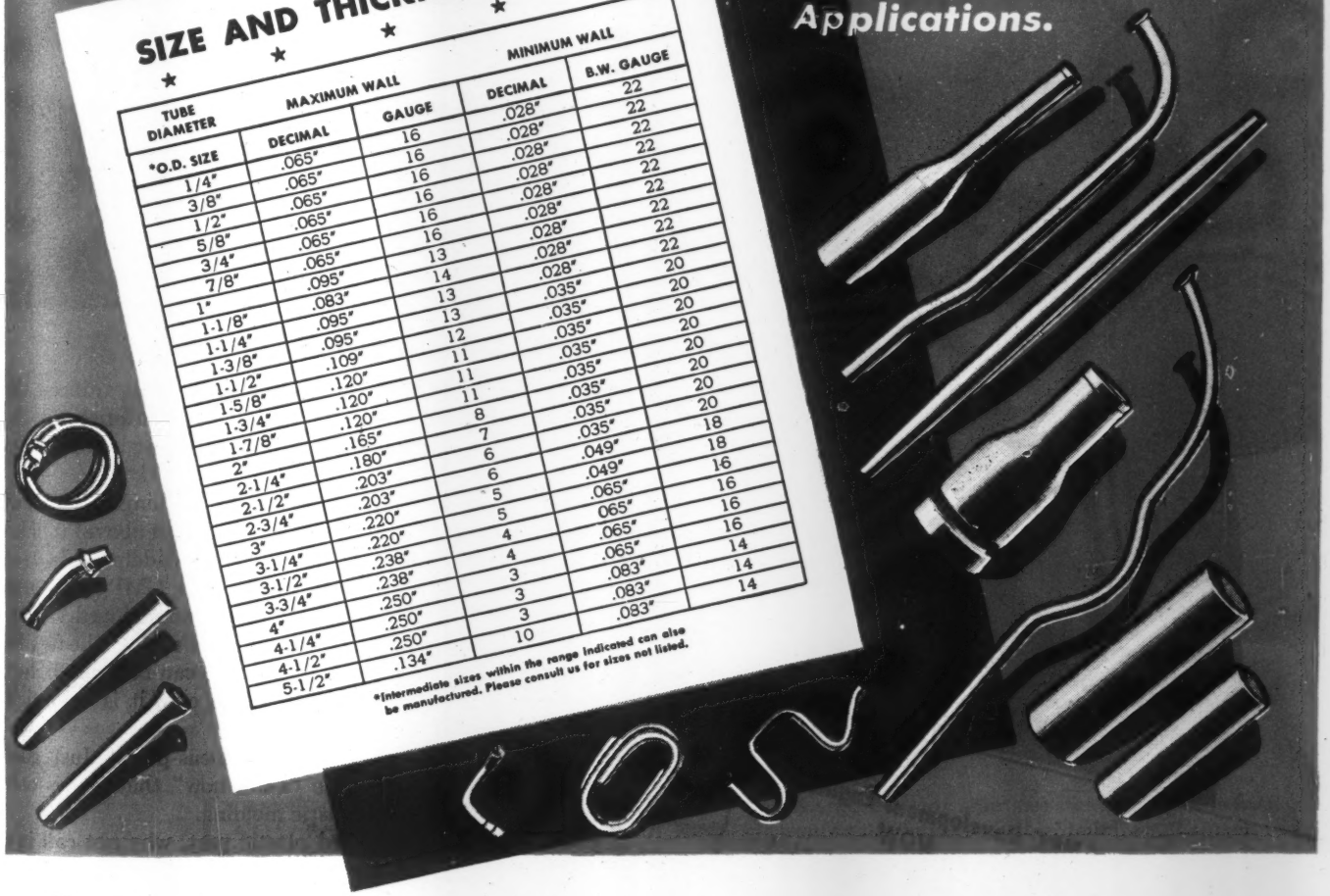
ELECTRIC WELDED STEEL TUBING

and Fabricated Tubular Parts for Mechanical, Pressure and Structural Applications.

SIZE AND THICKNESS CHART

TUBE DIAMETER	MAXIMUM WALL		MINIMUM WALL	
*O.D. SIZE	DECIMAL	GAUGE	DECIMAL	B.W. GAUGE
1/4"	.065"	16	.028"	22
3/8"	.065"	16	.028"	22
1/2"	.065"	16	.028"	22
5/8"	.065"	16	.028"	22
3/4"	.065"	16	.028"	22
7/8"	.095"	13	.028"	22
1"	.083"	14	.028"	22
1-1/8"	.095"	13	.028"	20
1-1/4"	.095"	13	.035"	20
1-3/8"	.109"	12	.035"	20
1-1/2"	.120"	11	.035"	20
1-5/8"	.120"	11	.035"	20
1-3/4"	.120"	11	.035"	20
1-7/8"	.165"	8	.035"	20
2"	.180"	7	.035"	20
2-1/4"	.203"	6	.049"	18
2-1/2"	.203"	6	.049"	18
2-3/4"	.220"	5	.065"	16
3"	.220"	5	065"	16
3-1/4"	.238"	4	.065"	16
3-1/2"	.238"	4	.065"	16
3-3/4"	.250"	3	.083"	14
4"	.250"	3	.083"	14
4-1/4"	.250"	3	.083"	14
4-1/2"	.134"	10		
5-1/2"				

*Intermediate sizes within the range indicated can also be manufactured. Please consult us for sizes not listed.



IN the construction of war products calling for the use of ELECTRIC WELDED STEEL TUBING, more and more manufacturers have discovered the advantages of specifying the "Standard" brand.

They've found that our wide variety of shapes and sizes gives them the kind of tubing they want. And they've found that our facilities for high speed production of both standard and special types enables them to get specified tubing delivered when they want it. Beyond these highly important considerations, they've discovered that our interested and willing cooperation in the solving of special tubing problems has helped them make their war products quicker, better and at lower cost.

These same advantages will be available when Victory is won. If you need a source of ELECTRIC WELDED STEEL TUBING now, or are planning a postwar product that will use this material, let our experience and facilities help you do a better job.

BUY MORE WAR BONDS

THE STANDARD TUBE CO.

Detroit 3, Michigan

STANDARD

Welded Tubing — *Steel Forgings*

★ *Complete Tube Stocks Maintained by* ★

STANDARD TUBE SALES CORP., One Admiral Ave., Maspeth, L. I., N.Y.
LAPHAM-HICKEY COMPANY, 3333 W. 47th Place, Chicago 32, Ill.
UNION HARDWARE & METAL CO., 411 E. First St., Los Angeles 54, Cal.

What is *Good design* in Molded Plastics?

GOOD DESIGN in molded plastics is design that utilizes the characteristics and properties of plastic materials to the best advantage. Naturally, that requires an intimate knowledge of materials, methods, and techniques.

An excellent example of what we mean is the hinged cover and bezel of the "Megger" Insulation Tester (shown above) molded by CMPC for James G. Biddle Company of Philadelphia. Instead of resorting to drilling and inserting hinge pins, CMPC designers and engineers found a better way. Bezel and hinged lid are produced in only two parts without the use of metal. The flexible bezel (molded of cellulose acetate butyrate) can be bent slightly for easy assembly. When attached to the case it is held rigid forming a substantial hinge.

Simple, isn't it? No magic . . . no hocus-pocus. Just good common sense coupled with the "know-how" that comes only with practical experience in plastic molding.

If you are planning a molded plastic part, why not call in a CMPC Development Engineer who can apply this "know-how" to your own problems? His knowledge and experience as well as that of our entire organization are at your disposal, together with the resources of the largest, best equipped custom molding plant in the Middle West. Write us today. Your request incurs no obligation.

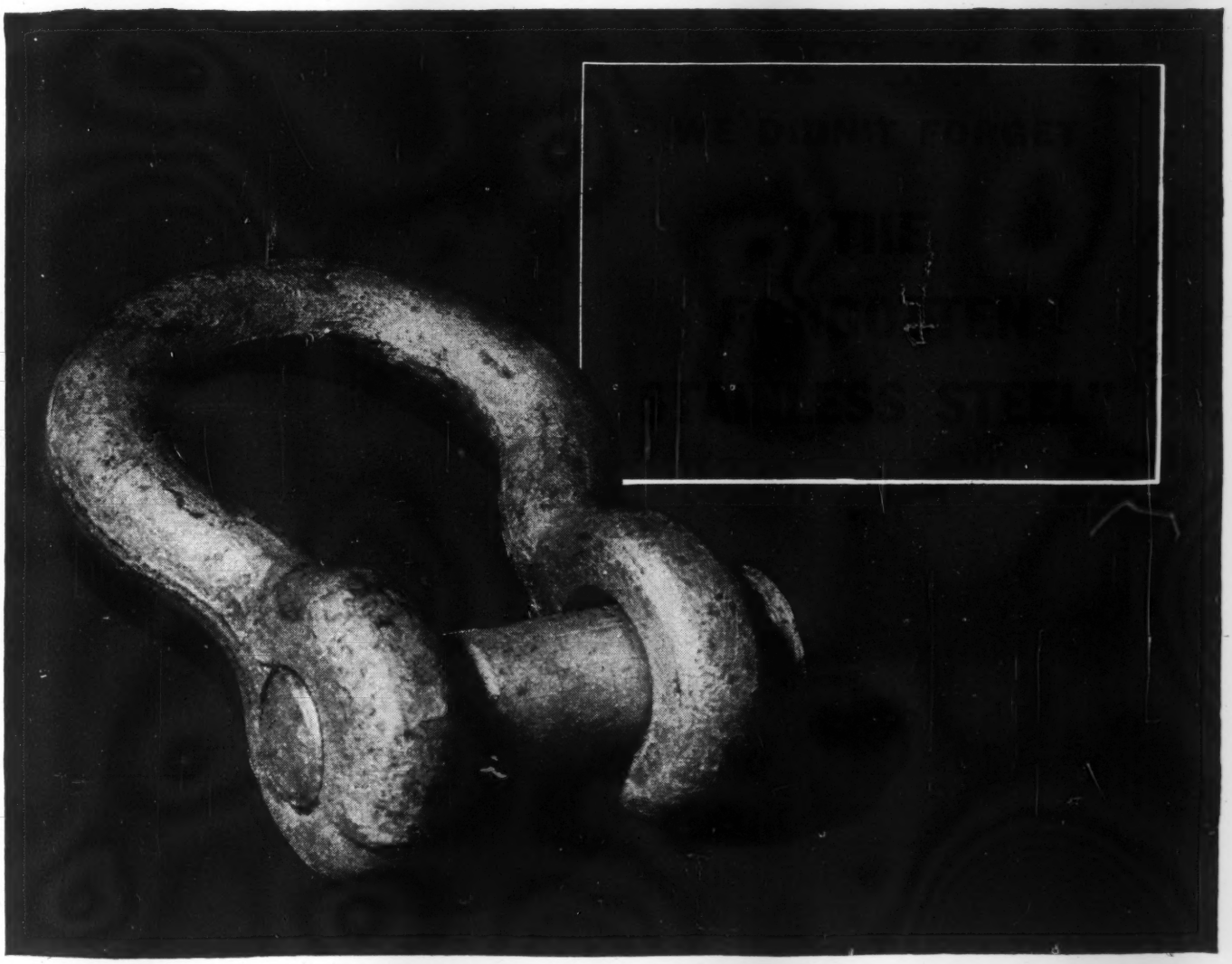
Here's How a CMPC Development Engineer Can Serve You . . . NOW

- By analyzing your products to determine what parts, if any, can be advantageously molded of plastics.
- By helping you in the selection of the best material or materials for your job.
- By putting at your disposal practical experience with the latest war-time developments in plastic molding materials and methods.
- By furnishing preliminary cost estimates to help you in choosing the most economical production methods.
- By suggesting design for most effective and economical utilization of plastics.
- By making laboratory tests to determine suitability of materials for special applications.
- By building experimental molds for sampling and tests.

CHICAGO MOLDED PRODUCTS CORPORATION

COMPRESSION, INJECTION, AND TRANSFER MOLDING OF ALL PLASTIC MATERIALS

1028 North Kolmar Chicago 51, Illinois



Rough forging, before machining, of towing shackle of Rustless 16-2 stainless steel (Chromium 15-17%, Nickel 1.25-2.50%, Carbon .20% max.), the alloy whose strength, impact and corrosion resistance and favorable strength-weight ratio make it especially valuable in marine and in other exacting services.

IT HAS BEEN SAID that 16-2 stainless steel (Type 431) was forgotten in this country, but Rustless did not neglect it. On the contrary, we learned how to handle it, have produced many thousands of tons of it successfully, and have helped our customers learn how to work it.

This grade is unusually tough in the hardened and stress-relieved condition. In that condition, it has an ultimate tensile strength of 175,000 PSI min.; yield strength, 135,000 PSI min.; elongation in 2″, 13% min.; and a minimum Izod impact strength of 35 ft. lbs. It has excellent resistance to certain types of corrosion, especially salt spray, tap water, steam and food products including fruit juices. In fact, 16-2 has the best corrosion resistance of any stainless steel hardenable by heat treatment. This gives it a definite advantage over the more customary 18-8 alloy for parts of such large section that cold working is impractical.

Rustless knows how to produce sound ingots and perfect bar, rod and wire of 16-2. Equally important, we have solved the once-vexing problem of heat treatment, so that the desired characteristics can be obtained in any shop with accuracy and uniformity. Data and instructions are available on request, on this and other stainless steels.

Write for new booklet, just off the press: "Heat Treatment of Stainless Steels." . . . Rustless Iron and Steel Corporation, Baltimore 13, Maryland.

RUSTLESS

Producing STAINLESS STEELS *Exclusively*

SALES OFFICES: BALTIMORE • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND
DETROIT • LOS ANGELES • MILWAUKEE • NEW YORK • PHILADELPHIA • PITTSBURGH • ST. LOUIS
DISTRIBUTORS IN PRINCIPAL CITIES

Under cover need NOT mean out of sight!

Glass-covered oven in the L·O·F "Kitchen of Tomorrow."

Where one material must do two jobs—provide visibility as well as protection—glass gets the nod.

Why not utilize the advantages of glass in your postwar product or equipment? . . . to prevent contamination of chemicals or foods, to protect fine fabrics or precision parts from dirt and moisture, to see maintenance troubles before they become serious, to protect workers from acids, high voltage and other dangers.

Glass is a tough structural material for this purpose. Few acids harm it. It defies weather—can neither rot nor rust. Won't absorb liquids or odors. Easy to clean, it can be tempered for amazing resistance to impact and thermal shock.

Moreover, glass gives you freedom in design—you can have it flat or curved . . . coated, polished or etched . . . transparent, translucent or opaque . . . colorful or colorless.

Before you get your designs on paper, consider what glass can do for you. And don't hesitate to call us in for help. Libbey·Owens·Ford Glass Co., 21104 Nicholas Bldg., Toledo 3, Ohio.

Destructible? **Wood—Metal—Plastics—Glass. No material is indestructible. However, barring unseen conditions, no material will fail on a job in which it has been properly specified and engineered. When our application engineers say "Yes", you can be sure about glass.**

*Copyright 1943 by Libbey·Owens·Ford Glass Co., Toledo, O.

LIBBEY·OWENS·FORD
a Great Name in **GLASS**

We've earned two Stars in our work for Victory. DO YOUR PART WITH WAR BONDS!

WE'LL DO BILLIONS —OF— GOOD TURNS THIS YEAR!

• The SPUNSTEEL automatic roll-forming lathes will continue to produce fan and generator drive and driven pulleys for war equipment until complete victory. But at the first notice of resumption of civilian goods manufacture, we will be ready to do you a good turn on special designs for unusual adaptations of pulleys . . . and keep on doing good turns . . . billions of them . . . to serve your specific needs with a product engineered to fit. Contracts are invited on units which will use all or part of our extensive stamping, brazing, welding, and assembling facilities in addition to patented automatic roll-forming. Write on company letterhead for brochure describing SPUNSTEEL accomplishments.

NEW, INFORMATIVE BROCHURE

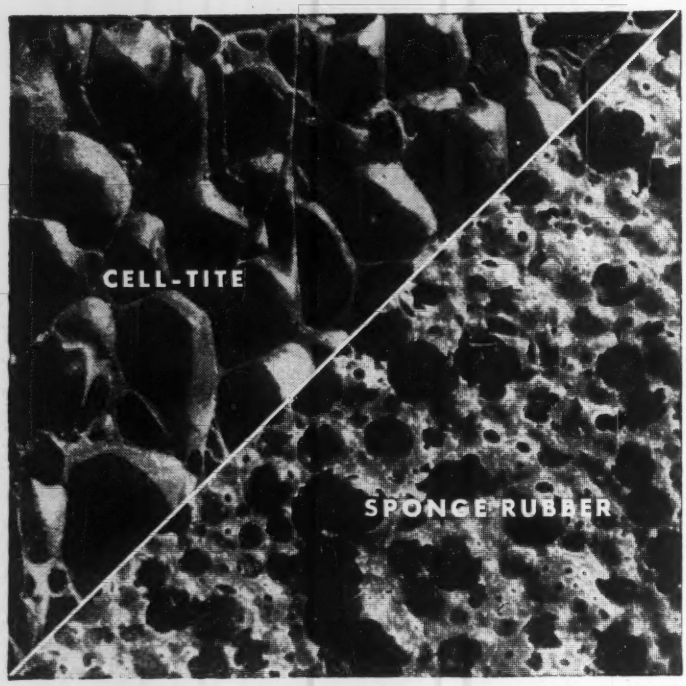
METAL ENGINEERING

a new technique in steel working that will save time and expense in fabrication of your metal parts, fully pictured and described in this colorful brochure. Write for it TODAY.

THE Spun Steel CORPORATION

SPUNSTEEL

2042 DUEBER AVENUE, S. W. - CANTON 6, OHIO



CELLULAR RUBBER

THIS VERSATILE MATERIAL SEALS AGAINST MOISTURE, DEADENS SOUND, DAMPENS VIBRATION, INSULATES, AND MAKES PRODUCTS LIGHTER.

Photographs at left (12 diameters) show cross sections of two basic types of cellular rubber. Popular before the war, their wartime record points to even wider usefulness in the improvement of many products for peace.

Sponge and Cell-Tite Rubber are made by expanding natural or synthetic rubber to produce lightweight, resilient materials that form effective barriers against heat, cold, shock, sound, vibration, electricity.

Cell-Tite is non-absorbent — cells are individual, non-connecting, filled with inert gases. Sponge rubber is *absorbent;* cells interconnect.

Cell-Tite may be *hardened* in the process of manufacture. Reputed to be the strongest structural material for its weight commercially produced, Cell-Tite Hard is thermoplastic; may be reshaped after manufacture.

We compound cellular rubbers to meet your exact need and supply you with sheets, strips, slabs, cord or tubing, pads, molded shapes or die-cut pieces.

This company began research and experimentation with cellular rubber in 1923. Prior to wartime restrictions, two of its products — Sponge Rubber and Cell-Tite* — had won widespread use in automobiles, refrigerators and other products in which insulation, sound deadening and vibration elimination were essential. This demand established us as the world's largest producer of this type of material.

Production capacity was expanded to meet war demands; hundreds of formulae originated to meet special requirements of war industries. Methods developed in our laboratories enable us to control cell structure, weight, tensile strength, amount of resistance to heat, chemicals, abrasion, oxidation — to compound cellular rubber in any form to meet any indicated industrial purpose.

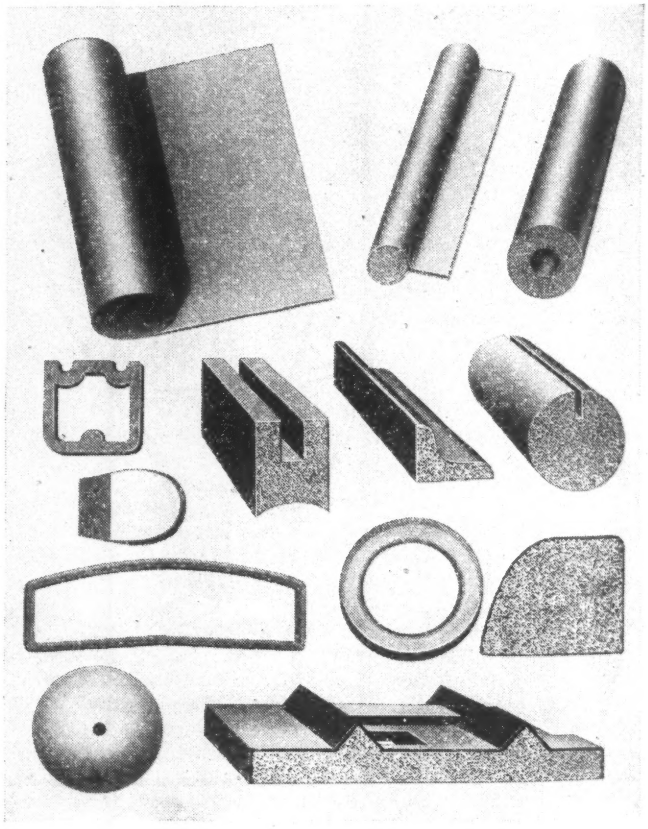
Our technical men are ready to work with you now. Some compounds of synthetic and reclaim rubber are available for experimental work and limited civilian manufacture. Tell us your problem; if it can be solved with cellular rubber, we'll help you solve it.

*Trade Mark Registered U. S. Patent Office

SOME USES OF CELLULAR RUBBER

There are hundreds of present uses; hundreds more potential uses. Wherever metal meets metal — in auto and aircraft doors, windows, frames, — strips and formed parts of cellular rubber seal, insulate, lessen sound and vibration. Hard and soft varieties insulate refrigerators and quick-freeze units; are used in the marine industry for life-preservers, life rafts.

Cell-Title Hard is the most efficient and durable material known for flotation purposes. Dielectric properties of Cell-Tite Hard, have led to its wide use in radio and radar equipment.



Sponge Rubber Products Co.

122 Housatonic Avenue

DERBY, CONN.

MORGANITE SELF-LUBRICATING BEARINGS

assure full protection at all times

Whether for high speed, continuous operations, where lubrication ordinarily must be thorough and dependable, or for speeds so slow that an oil film—though difficult to maintain—should be constant, MORGANITE bearings will do the job absolutely free of lubrication of any kind.

Their extremely high temperature limits—up to 900° F, low coefficients of both expansion and friction, quietness of operation, and complete resistance to acid, alkalis and other chemicals, make those MORGANITE components ideal for innumerable industrial and civilian applications.

Featuring low initial cost, negligible maintenance and availability of a type and grade to meet practically every requirement, MORGANITE self-lubricating bearings provide a complete solution to difficult bearing problems.

★ ★ ★

Literature is available, without obligation, describing the entire line of MORGANITE products, including motor and generator brushes, meter valves, seal rings, etc. Address requests to MORGANITE BRUSH COMPANY, INC., Long Island City, 1, N. Y.

MORGANITE

friction-minimizing CARBON SPECIALTIES

Organized to handle TOUGH molding jobs

THERE are many plastic molding jobs that practically any molder can handle. But there are others that offer some particular problem such as extra deep drawing, close tolerances, multiplicity of inserts, side cores, fine threading, or where some special technique must be used.

While we handle all types of jobs from the simplest to the most complicated, it is on the really *TOUGH* jobs that we can demonstrate the full value of Imperial Engineering Service.

BULLETIN K-200—with its helpful comparative table on the characteristics of various compression molded plastics and a brief picture story of how the Imperial molding plant operates—may be of interest to you.

Your request will bring a copy.

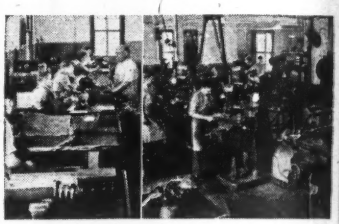
The parts shown above are typical specimens of specialized molding work for such organizations as: Teletype Corp., Dixie Cup Co., Bastian Blessing Co., Bell & Howell Co., Simpson Electric Co., Allis-Chalmers Mfg. Co., National Enamelling & Stamping Co., Radio Speakers, Inc., The Imperial Brass Mfg. Co.

And the views of our plant at the right present just a suggestion of the organization that has been built to handle *TOUGH* molding jobs.

If you have molding requirements that call for a broad background of engineering experience and the most modern plant facilities we shall be pleased to work with you—subject of course to present day limitations imposed by our work for the armed forces.

IMPERIAL MOLDED PRODUCTS CORP.
2855 West Harrison St., Chicago 12, Ill.

● Our marked success in handling complicated parts requiring close tolerances, threading and inserts is largely the result of sound "know-how" engineering.



● Our mold makers are specialists in the plastic field and have developed many advances in methods of mold construction. For example, you'll find that threads on Imperial parts are smoother—and harder. This is because threading dies are milled—not turned as is customary.

● Molding equipment includes compression presses of all practical sizes, both of the hand and semi-automatic types. Preforming and measuring machines are utilized for processing molding powder. Infra-red and radio frequency preheating facilities are available.

● The final operations on the molded part are completed in the finishing department. Trimmers take off the fins, and any other necessary operations are performed such as drilling and tapping of holes and inserts, etc. Polishers bring out the special lustre required on certain parts through the use of buffing wheels. Special machines are also utilized for polishing.

IMPERIAL
Plastic Molding

BAKELITE ★ PLASKON ★ DUREZ ★ MAXALOT ★ TENITE ★ BEETLE ★ LUCITE

SPECIALIZED EXPERIENCE Has Produced Ostuco Quality Tubing

Whether you're looking forward to continuing present production for peacetime promotion or whether you're developing new products, you know that using quality materials will help boost your position competitively. And *quality* is the goal set at OSTUCO in the manufacture of seamless steel tubing—tubing that is well known to design and production engineers for its many applications to machine tools and products they produce.

OSTUCO has always specialized in the production of seamless tubing for out-of-the-ordinary tubing applications. This experience, coupled with high inspection standards, and precision testings, is responsible for the *quality* of OSTUCO tubing—a *quality* that has withstood the test of time by establishing a long, continuous record for low rejections. At all times, you will find OSTUCO delivers *quality* seamless and electric-weld tubing that goes beyond blueprint specifications.

OSTUCO's experienced sales representatives can offer you the services of expert engineers who have been instrumental in developing *quality* tubing, and who will gladly assist you in solving your particular tubing problem for the reconstruction period ahead.

• • •

THESE SALES OFFICES ARE READY TO SERVE YOU

Chicago 6, Illinois.....Civic Opera Bldg., 20 N. Wacker Drive
Cleveland 14, Ohio.....1328 Citizens' Bldg.
Detroit 2, Michigan.....2857 E. Grand Blvd.
Houston, Texas.....1006 Washington
Los Angeles, Calif.....Suite 200-170 So. Beverly Drive Beverly Hills, California
Minneapolis 2, Minn.....308 Thorpe Bldg.
Moline, Illinois.....225 Fifth Ave. Bldg.
Montreal, Quebec, Canada.....3735-3745 St. James St.
New York City 17, N. Y.....70 East 45th St.
Philadelphia 9, Pa.....123 S. Broad St.
Syracuse, N. Y.....501 Roberts Ave.
Toronto, Canada.....77-79 Front St. E.
Tulsa 3, Oklahoma.....604 Tulsa Loan Bldg.
Vancouver, B. C., Canada.....1016 Mainland St.

THE OHIO SEAMLESS TUBE COMPANY

MANUFACTURERS OF SEAMLESS AND ELECTRIC-WELD STEEL TUBING

SHELBY OSTUCO OHIO

PLATEN FOR HYDRAULIC PRESS

cognition for quality which Continental castings have
eved is the result of years' experience producing carbon
d alloy steel castings. A highly skilled organization, modern
hops, special inspection and testing devices are your assur-
ce of the maximum in casting service. Next time call in a
tinental engineer for your casting requirements.

Other Continental products include Rolls, Rolling
ment and Special Machinery.

Continental Foundry & Machine Company

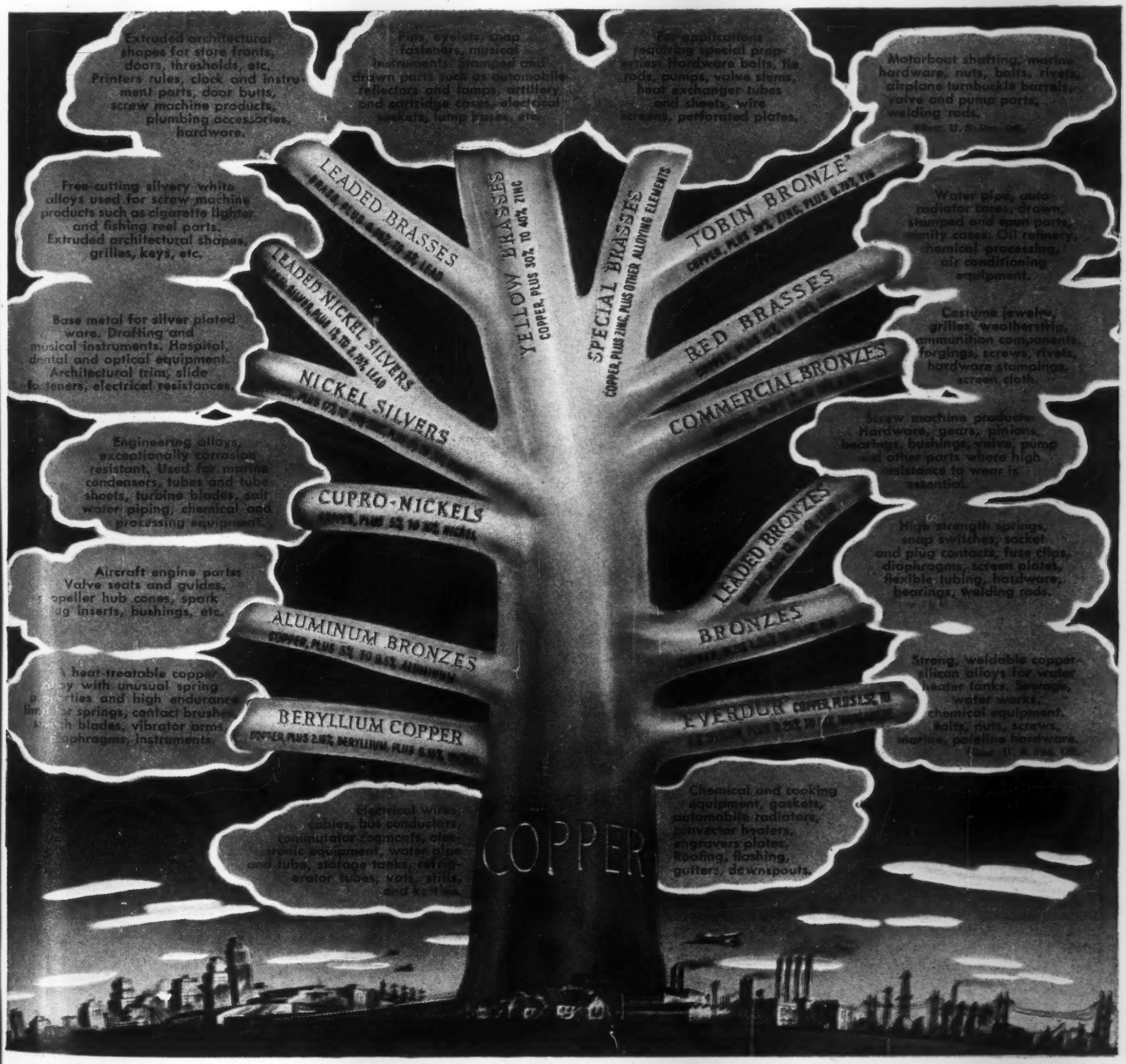
Copper is the trunk of an indispensable family tree

THE COPPER family of alloys is versatile, indeed. These dependable metals have contributed to the development of practically all technical and industrial progress. Other metals may have more distinctive properties. Chromium is harder; magnesium is lighter; silver has higher conductivity. But . . . of all commercial metals, copper and its alloys *combine to best advantage* a range of physical and chemical properties not found in any other group.

These properties include a high degree of corrosion resistance; high tensile strength and fatigue resistance; ductility; hardness; toughness; ready weldability; resistance to abrasion; hot or cold workability; machinability, and high thermal and electrical conductivity.

Yet, these very properties, singly or in combination, can be varied to a considerable extent by metallurgical adjustment of composition and by changes in the technique of fabrication. When it is considered that Anaconda Products are made not only of copper, but of copper alloyed with zinc, tin, nickel, lead, aluminum,

(continued on next page)



ANACONDA
from mine to consumer

Anaconda Copper & Copper Alloys

The Scope of

(continued from preceding page)

manganese, silicon, beryllium, chromium and other elements, and that each alloy is produced in a wide variety of commercial sizes and shapes, the need for strict laboratory control of all materials and every step of production becomes readily evident.

2,506,329 Laboratory Tests made in 1943

The scope of routine laboratory control over all mill operations and practices can be gaged by the number of tests made during 1943 in the laboratories of The American Brass Company—2,506,329. This includes tension and bend tests, conductivity or resistance tests, examinations under the chemical and metallurgical microscopes, and chemical and spectrographic determinations.

Examining a spectrum plate. The presence or absence of various elements is determined by matching a master plate with the unknown spectrum. Semi-quantitative analysis can be made by comparing the relative intensity of element lines in the sample spectrum with those in exposures of standard samples made on the same plate.

CHEMICAL AND METALLOGRAPHIC LABORATORIES

A. Electrolysis is utilized for the accurate and rapid determination of copper and certain other elements in copper alloys. In this apparatus, platinum anodes are mechanically rotated. The exact weight of copper after deposition and drying is quickly indicated by the latest type Projection Reading Analytical Balance. Determinations of copper and lead contents, for instance, can be made in less than an hour. **B.** The American Brass Company pioneered in its field in the use of colorimetric methods of analysis. The Photo-Electric Colorimeter illustrated accurately determines amounts of certain constituents of copper base alloys—in minutes, instead of hours formerly required by the usual wet methods of analysis. **C.** Control of grain structure is important in obtaining the required physical properties of copper alloys. Here, on the Grain Size Comparator, the diameter of average grain of a brass specimen is being determined by directly comparing the magnified image of the specimen with "transparencies" of known standards. **D.** The preparation of all types of specimens and the production of photomicrographs at medium and high magnifications require a high order of skill and experience in operating the metallographer's most useful tool —the Metallurgical Microscope. In technical circles an enviable reputation has been earned by The American Brass Company for the excellence of its photomicrographs.... But before microscopic examination can be made, the specimen must be carefully polished and etched to reveal the essential details. An electrolytic method of doing this had been brought to a high state of development by The American Brass Company, and routine use for a period of several years has proved its advantages over the slower method of mechanical polishing and chemical etching.

ANACONDA
from mine to consumer
Anaconda Copper & Copper Alloys

TECHNICAL CONTROL over Anaconda Alloys

Such extensive application to technical details—plus the craftsmanship inherent in more than a century of experience in the art of making brass—have led the way in producing Anaconda Alloys possessing unusual uniformity and dependability.

Foremost in Research

You would expect the largest fabricator of copper and copper alloys to be foremost in the search for greater metallurgical knowledge in that field:

As early as the turn of the century, The American Brass Company instituted routine laboratory control of alloy compositions, replacing the father-to-son methods of mixture determination which up to then had prevailed throughout the Industry.

In 1902, the trend toward more accurate control of grain size and structure was initiated through the use of the metallurgical microscope.

In 1914, a large quartz spectrograph was installed, the first in this country to be used for metallurgical research and qualitative analysis of alloys.

The Research Department of The American Brass Company has produced and tested thousands of copper base alloys, many of which are now in common use for special types of service, providing higher strength, greater workability, and better corrosion resistance than ever before available.

It has often combined in one alloy the specific properties of several others, providing an opportu-

(continued on next page)

E F G

RESEARCH AND SPECTROGRAPHIC LABORATORIES

Operations performed in the spectrographic analysis of metals are of three types: Qualitative—in which the identity of the elements alloyed to form the sample is established; Quantitative—in which the presence of certain elements is confirmed and the amount of each measured precisely; or Semi-Quantitative — in which certain elements are identified and the amounts estimated by comparison with standards representing the specification limits. **E.** In this quartz prism spectrograph, radiation from the arc passes through the slit and is dispersed by the large quartz prism to form on the photographic plate an image of the slit for every wave length present in the arc. Each element "writes its signature" on the plate—positive proof that the element responsible for those lines is present in the sample. **F.** Rather than by a prism, dispersion of the radiation passing through the slit on this grating-type Spectrograph is obtained by a diffraction grating ruled on a concave mirror. The spectral lines characteristic of each element vary in intensity in proportion to the amount of the element present in the sample. **G.** This Densitometer-Comparator is being used for examination of spectra taken on the grating-type Spectrograph. A magnified image of the spectrum appears on the screen, and is compared with a master plate imaged on the lower third of the screen. **H.** This X-ray Diffraction Unit has a wide variety of research applications: Determinations of the amount and type of preferred orientation; identification of phases, and determination of their lattice parameters are a few. Certain mill operations also are brought under more rigorous control with its aid.

H

Made by The American Brass Company

PLANNED RESEARCH is finding the answers to many metal problems

(continued from preceding page)

nity for manufacturers to reduce production costs, simplify tooling requirements, and increase the serviceability and value of their product.

It has developed mill procedures to facilitate production and assure quality.

It has developed readily weldable copper base alloys, welding rods, and procedures for their use—making possible the economical use of strong, corrosion resistant, lightweight assemblies where more cumbersome castings of rustable metals were formerly employed.

Answers to other metal problems have been found in the development of strong, ductile, workable alloys of brass, bronze or nickel silver—with composition, temper and grain size adjusted to provide the best combination of characteristics for operations such as spinning, stamping, cupping, forming, deep drawing or machining. Resulting economies include longer life for dies and cutting tools, greater uniformity of parts, product improvement, and a lower over-all manufacturing cost.

The goal of this painstaking laboratory control and planned research program is that the Anaconda Copper or Copper Alloys you select will fully meet your manufacturing requirements and the service standards of your product—that they will be moderate in price, economical to use, and wholly adequate to your needs.

The Technical Department of The American Brass Company will be glad to work with you in selecting the best metal for a specific application.

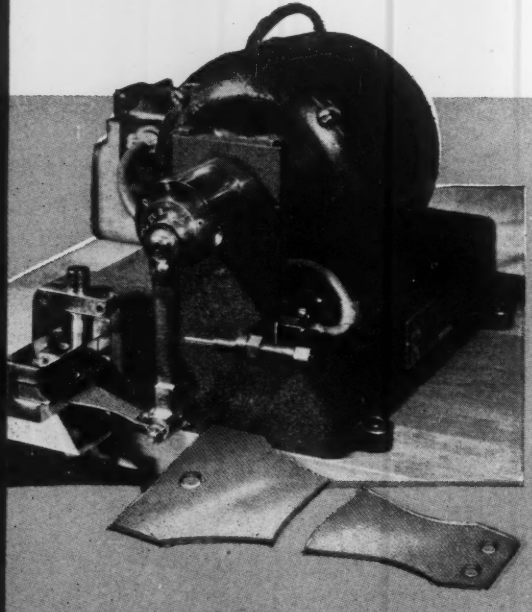
ANACONDA from mine to consumer

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut • Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ontario*

44118

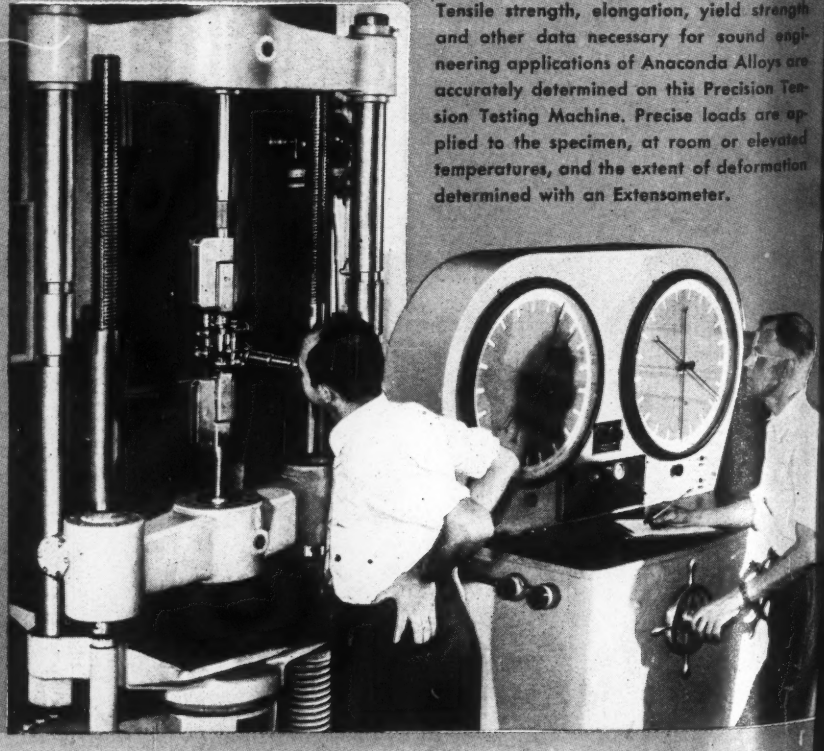


TESTED TO DESTRUCTION—

—so that Anaconda Metals in service may have longer life. Performance of Anaconda Alloys in simulated service is constantly checked in the Testing Laboratories. This broken phosphor bronze strip fatigue specimen withstood approximately 50,000,000 cycles of reversed stress, on the Fatigue Machine illustrated, at a deflection corresponding to an initial stress of 25,000 lb. per sq. in. before failure occurred.

SECTION OF PHYSICAL TESTING LABORATORY

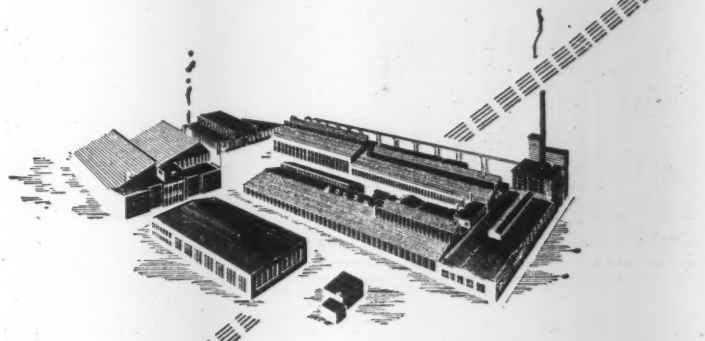
Tensile strength, elongation, yield strength and other data necessary for sound engineering applications of Anaconda Alloys are accurately determined on this Precision Tension Testing Machine. Precise loads are applied to the specimen, at room or elevated temperatures, and the extent of deformation determined with an Extensometer.



Anaconda Copper & Copper Alloys

One purpose • • •

the IMPROVEMENT of Metals



by Forging

High Pressure Valve Forging with a combination of bosses and depressions in the forging of which the metal has been distributed so as to completely fill out all sections of the forging to close tolerances.

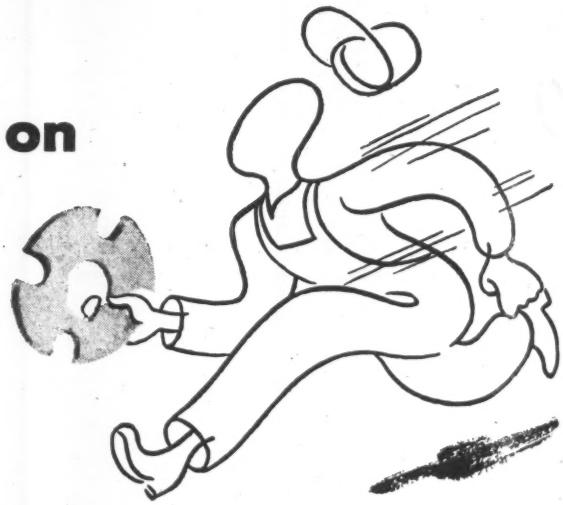
Designing stressed parts especially for forging, rather than for other techniques, is essential to obtain the utmost metal quality which a specific grade of metal affords. Whatever the shape, size, weight or design of a part, the primary objective of the IMPROVEMENT OF METALS BY FORGING is always to develop fully the metal quality which a specific grade of metal affords. Complexity of design should involve no compromise with quality, for strength and toughness are vital to all stressed parts. Holes, deep depressions, and recesses require unusually skillful die design and forging craftsmanship to hot work the metal throughout the full depth of the wall sections forming a hole or a pocket. Throughout 31 years of forging production experience, our engineers have succeeded in forging many so-called impossible-to-forge designs, thereby effecting marked improvements in many products. Ask one of our forging engineers to show you how forgings improve product performance.

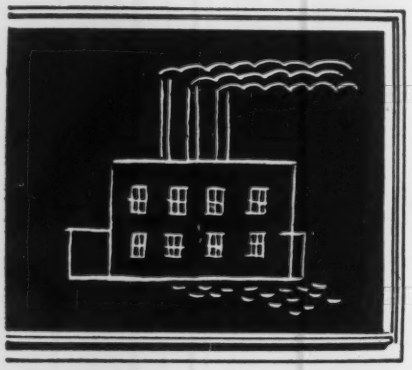
DROP FORGINGS

THE STEEL IMPROVEMENT & FORGE CO.

954 East 64th Street CLEVELAND, OHIO

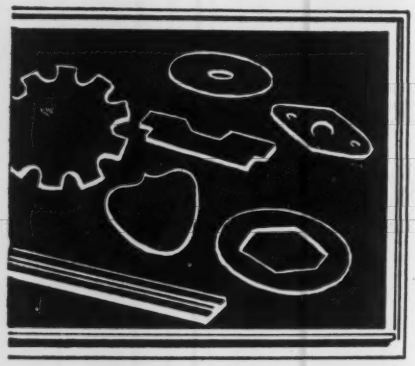
Want immediate delivery on felt cut parts?





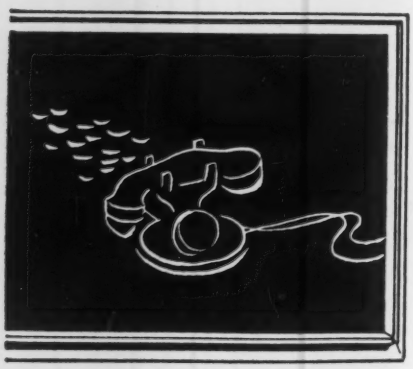
use this single source

We control the product—from the raw material to the finished felt part. This single responsibility means constant supervision of all operation and assures uniform standards for each grade of felt.



depend on Felters' accurate cutting

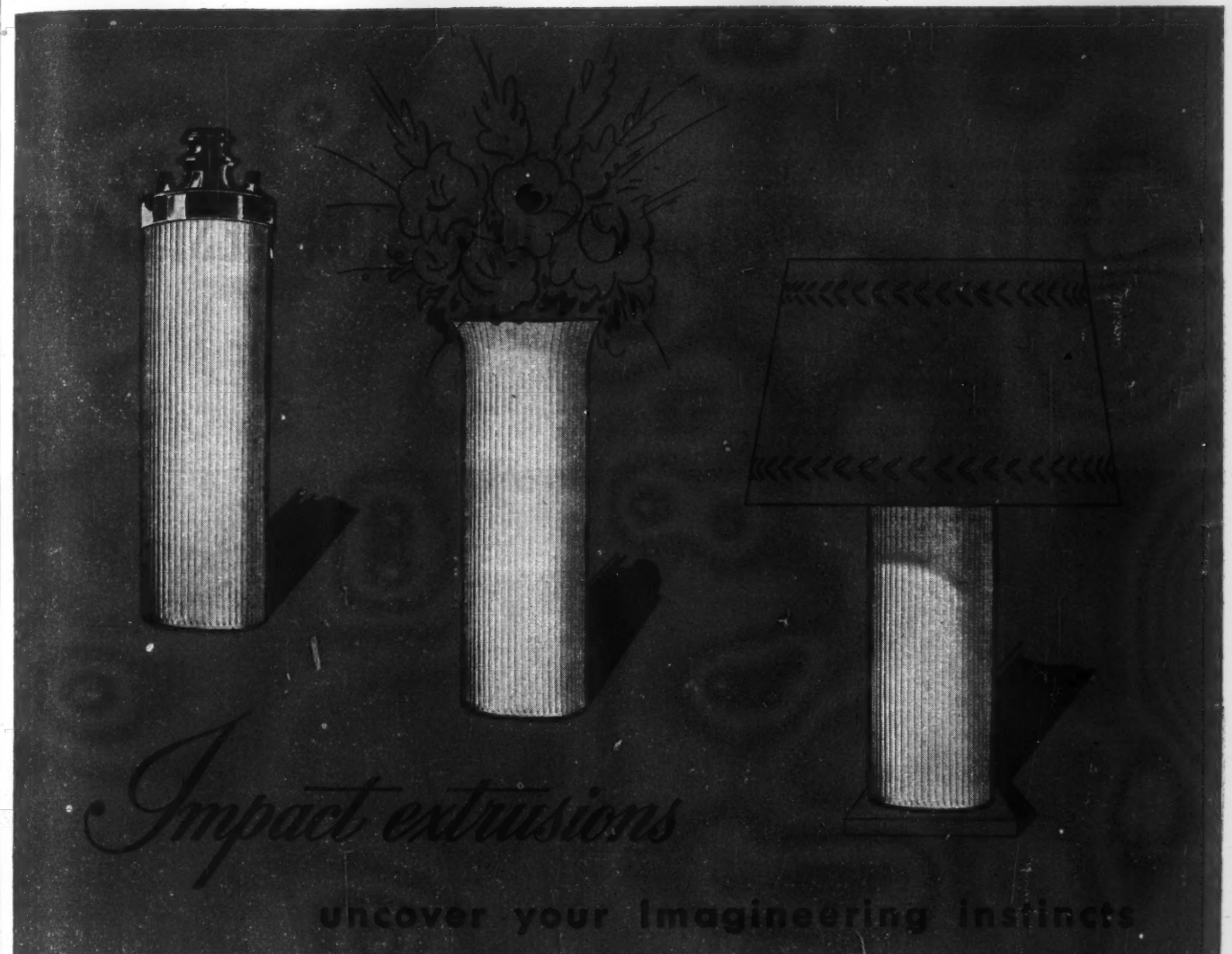
Through the years, as we've learned more about cutting felt, we have designed and made many of our cutting machines and all our own dies . . . so that our customers can depend on Felters cut felt parts to be accurate in every detail—whether their order calls for 100 or 10,000.



and call on our experienced engineering advice

Our sales engineers are available to you for consultation on any design problems . . . or any other questions you may have concerning felt. We can also make recommendations, through our laboratory, both from a chemical and engineering standpoint. Write for our newest book, "Manufactured Felt Parts for Industrial Use." The Felters Company, 210-E South Street, Boston, Mass.

_____put in your post-war picture



Impact extrusions

uncover your Imagineering instincts

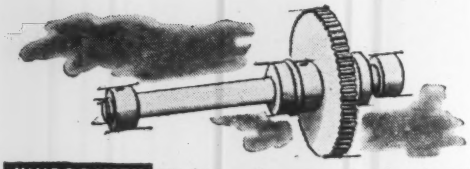
Put a plastic cap on this aluminum impact extrusion, as Alcoa's customer does, and you have the container for an electrical coil. But show it to an "Imagineer" and you hear a dozen different ideas—

Flare its open end to make an unusual, attractive vase—Turn it upside down on a plastic base, wire it for electricity, and you have a beautiful table lamp—Extend those fins even more than here, and you get a superior heat-radiating case for any kind of electrical or mechanical equipment. And so the suggestions go, on and on.

But the method of making this part—the impact extrusion process—is even more intriguing. One wallop of a press on an aluminum blank and it is formed, ribs on the inside or out, bosses in the bottom, if needed. The Alumilite finish (process patented) may be added, increasing corrosion resistance and making the shell most attractive, in plain aluminum or a variety of other colors.

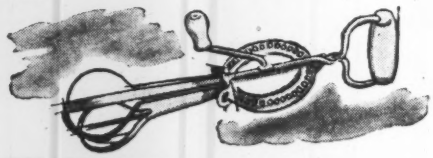
Final costs are often less when you start with Alcoa impact extrusions, because so little work is required to complete them. Winning the war comes first, but aluminum is now being used for other-than-war purposes as the manpower situation permits. Our representative will be glad to discuss the availability of aluminum with you. Write ALUMINUM COMPANY OF AMERICA, 1940 Gulf Building Pittsburgh 19, Pennsylvania.

ALCOA ALUMINUM

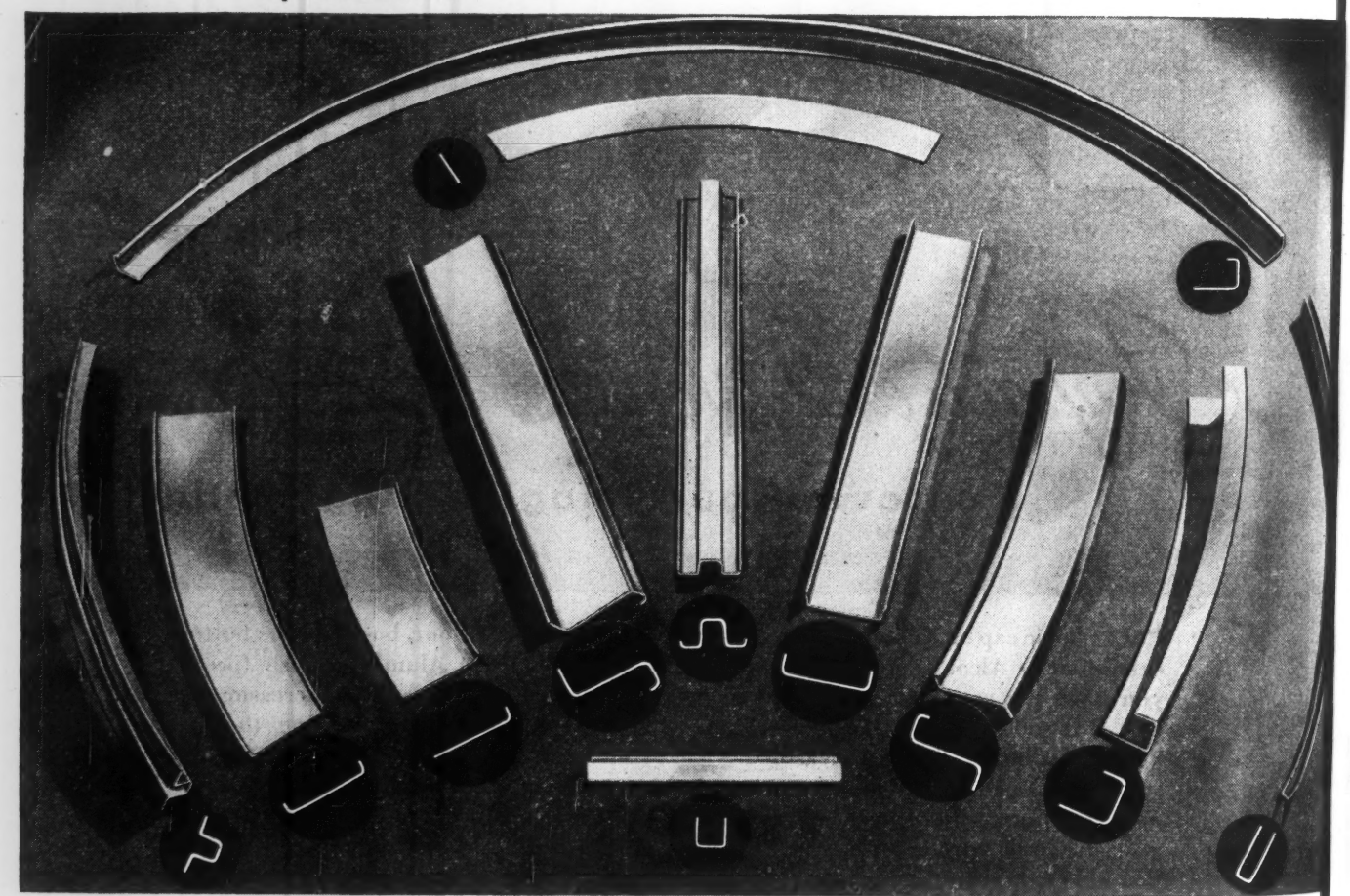


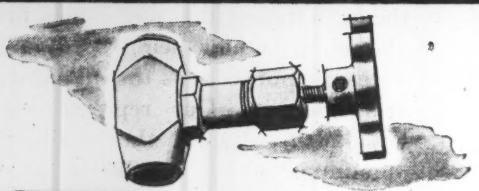
UNIFORMITY High tensile strength plus hair-line machining was required on this job. Mass production was made possible with unusual close and uniform tolerance Carpenter Stainless bars.

You Get CORROSION RESISTANCE.



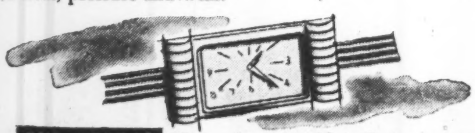
LOW UNIT COST To gain sales appeal yet keep price competitive, kitchen implements, like the egg beater shown above, gain distinct advantages when made from Carpenter Stainless Steel.





LONG LIFE Valves made from Carpenter Stainless provide resistance to corrosion from a wide range of chemicals and withstand heat, pressure and wear.

DESIGN FLEXIBILITY These shapes illustrate what you can do with easy-to-fabricate Carpenter Stainless Strip. Lighter gauges and sharper radii are possible with this versatile metal. The life of the product you are designing now can be lengthened, its sales appeal enhanced, by making it from bright, uniform Carpenter Stainless Steels.



EYE APPEAL Unusual eye-catching designs captured in sparkling Stainless! It's easy when you specify Carpenter! For this Stainless trim a light gauge was used without sacrifice of strength and rigidity.

Plus these

NEW DESIGN POSSIBILITIES

with Carpenter Stainless!

That gleam in your designer's eye probably means one thing: you're planning to launch some exciting new or redesigned product in the postwar market.

Very likely Stainless Steel will feature in your plans—for Stainless not only provides resistance to corrosion, heat and wear, but high strength/weight ratio, special physicals, and gleaming surface finishes that stay everlastingly bright.

As the pioneer in the development of Stainless Steels, and inventor of Free-Machining Stainless Steels, we'd like to apply our diversified peacetime and wartime experience to help solve your specific Stainless problems.

There are three ways you can benefit by working with Carpenter in your postwar planning:

1. By starting with Carpenter Stainless Steels, which through rigid controls in manufacture, can be counted on to have the same uniform fabricating qualities, lot after lot.

2. Through a service program which aims to help Stainless users select the analysis that will best meet the particular fabrication, corrosion, and physical requirements.

3. By taking advantage of Carpenter metallurgical and engineering assistance in solving new and different problems of fabrication. This helps prevent trouble *before it starts,* speeds production, and reduces fabricating costs.

Take the first step to secure this helpful Stainless design-engineering cooperation by calling in your nearby Carpenter representative. Talk over your problems with him—get the benefit of his long Stainless experience. If you have not already received a copy of our 98-page book, "Working Data for Carpenter Stainless Steels," drop us a line on your company letterhead indicating your title.

Give Your Product These Advantages

- Sales Appeal
- Everlasting Beauty
- Freedom from Rust
- No Plating to Peel
- Weight Saving
- Strength and Rigidity
- Ease of Assembly
- Fewer Service Complaints

THE CARPENTER STEEL COMPANY, 120 W. BERN ST., READING, PA.

Carpenter STAINLESS STEELS

BRANCHES AT Chicago, Cleveland, Detroit, Hartford, St. Louis, Indianapolis, New York, Philadelphia

Shielding the ELECTRON MICROSCOPE From Vibration

With the Electron Microscope, scientists are enabled to peer into new worlds, at magnifications up to 100,000 times. *Vibration, however, magnifies at the same rate.* Even though so infinitesimal it can't be felt, it must be eliminated if a perfect image is to be secured.

This baffling difficulty was overcome by U.S. Rubber technicians. They developed a set of rubber mountings engineered to a remarkable point of precision and efficiency. Observations revealed that these mountings completely eliminated all traces of vibration.

Makers of delicate instruments, electronic apparatus, light and heavy machinery, even railway and street cars draw upon the experience of the "U.S." staff for new and important applications of U.S. Rubber Mountings. In "U.S." laboratories, each such problem is treated individually, each mounting compounded and tooled to precise specifications.

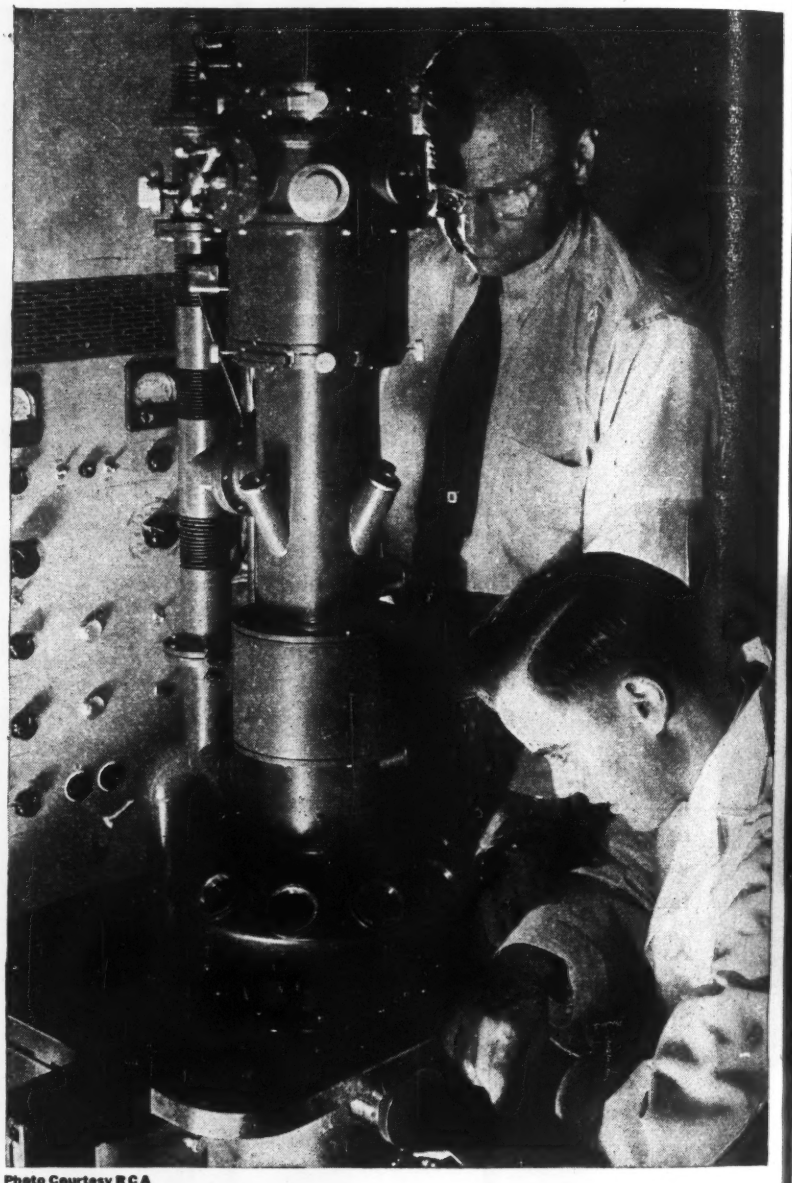
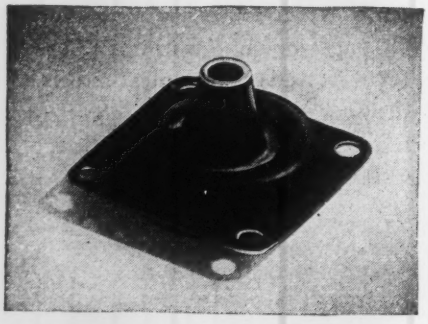
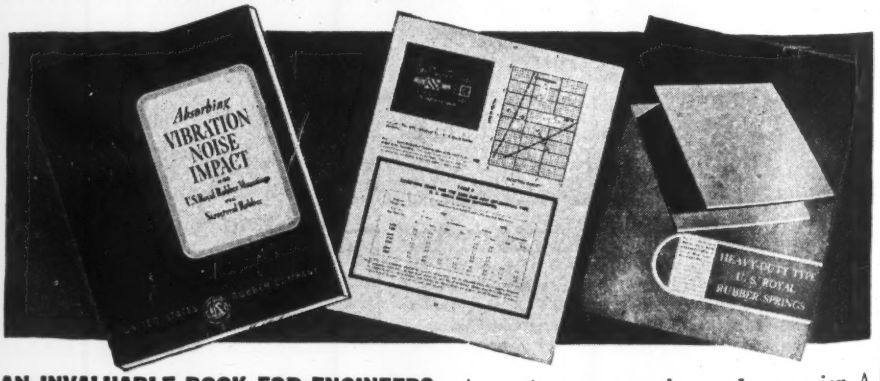


Photo Courtesy RCA

SERVING THROUGH SCIENCE





SCIENCE OF SMOOTHNESS—U.S. Rubber technology is removing guesswork from the elimination of noise, vibration and shock. Results are pre-determined and qualities of performance known in advance of installation.

AN INVALUABLE BOOK FOR ENGINEERS—an exhaustive book, "Absorbing Vibration, Noise, Impact", replete with blueprints, charts, photographs and explanatory text, contains much new and important information especially pertinent to postwar conversion and expansion. A limited number is now available. Engineers and architects can obtain copies by writing on company stationery to "Mechanical Goods Division," Room 1406. There is no obligation.

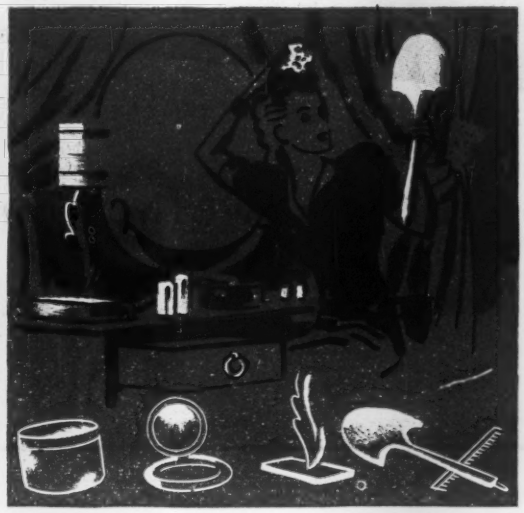
Listen to the Philharmonic-Symphony program over the CBS network Sunday afternoon, 3:00 to 4:30 E.W.T. Carl Van Doren and a guest star present an interlude of historical significance.

UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE • ROCKEFELLER CENTER • NEW YORK 20, N. Y.

Why Plastic Plans Start with Polystyrene

Its outstanding properties . . . its huge production and consequent availability in the future . . . its low price . . . all these factors point to Styron (Dow Polystyrene).



To say that plastic plans start with Styron (Dow Polystyrene) is to make a big statement. But analysis of the plastics field shows it to be backed up by many factors—factors of far-reaching significance.

The things that Styron is capable of doing—its wide field of application—plus the production capacity and resultant economic advantages create a distinct niche for Styron in the plastics field.

Let's look at availability, for example. To meet huge war needs, Styron manufacturing facilities were expanded tremendously and production zoomed upward. These extensive facilities—the greatest of any plastic material—mean that the future price tag on Styron will be right—perhaps even revolutionary.

As to the material itself, the properties of Styron are already well known. Its many uses have been proved again and again . . . for electrical applications where outstanding insulating properties are required . . . in the field of science where immunity to acids and alkalies is important . . . for precision moldings that must retain their shape and detail . . . for jewelry and decoration where brilliant color and clear transparency are demanded.

You will want to know more about Styron—it is the plastic to keep your eye on. We'll be glad to send further details.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago
St. Louis • Houston • San Francisco • Los Angeles • Seattle

DOW PLASTICS INCLUDE

STYRON . . . for fabricators producing moldings, extrusions, rod, sheet.

ETHOCEL . . . for fabricators producing moldings, extrusions, coatings; available also as Ethocel Sheeting.

SARAN . . . for fabricators producing moldings, extrusions, pipe, tubing, sheet, coatings, also as Saran Film.

STYRON

(DOW POLYSTYRENE)

DOW CHEMICAL PLASTICS

INDISPENSABLE TO INDUSTRY AND VICTORY

. . . but they all know that any RANGE MUST HAVE GOOD INSULATION

Proof of the "sales appeal" of your product will be determined in the dealer's salesroom. And, as always, the final test of the functional design of a range is given in the user's kitchen.

Uniform results in baking, also economy of operation, depend largely upon the efficiency and physical properties of the material used in insulating the oven.

Fiberglas in the Front Rank*

Fiberglas Insulating Wool, Type TW-F, withstands temperatures up to 1000° F. And while it is produced for commercial use, weighing 3 pounds per cu. ft., its resiliency permits the range manufacturer to install it at any density to meet the specific requirement for thermal efficiency. For example: when compressed slightly to a density of 3½ pounds per cu. ft., its thermal conductivity is .26 at 75° F. mean temperature—*and only .36 at 250° F. mean temperature.*

Light weight and extremely resilient, Fiberglas TW-F never settles or packs down. Instead, it tends to expand, assuring a well-insulated oven —from production line to the home.

Fiberglas, being glass, is *unaffected by moisture* and does not absorb or hold cooking odors which might find their way from the oven into the insulation.

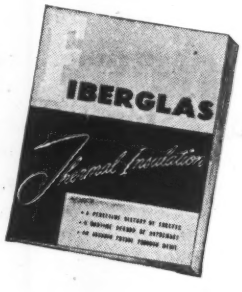
Chemically stable, it will not corrode—nor is it corrosive to aluminum or steel even in the presence of moisture. And it provides no sustenance for vermin.

It is easily understandable how Fiberglas, with all of these qualities, rose to the front rank among insulations for ranges and other household appliances in which heat and cold must be controlled.

And this preference for Fiberglas reaches to the consumer, too, as a result of the long, satisfactory performance of Fiberglas-insulated equipment and the consistent advertising program acquainting the public with Fiberglas in its many forms.

Send for FREE booklet

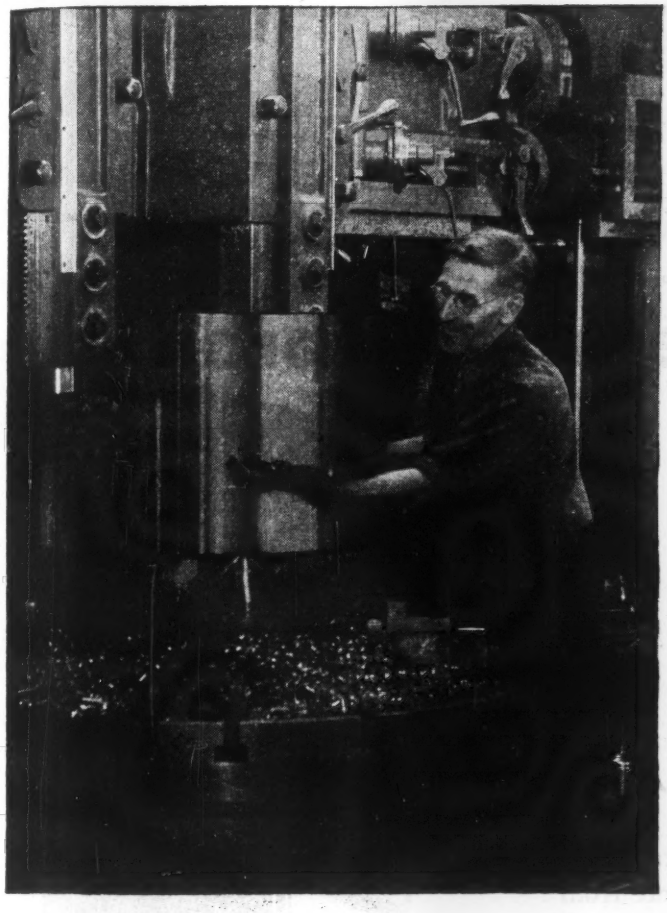
Here's a booklet that will bring you up to date on the subject of insulating household equipment. Write for "Fiberglas Thermal Insulation". It should be helpful to you in your present planning. *Owens-Corning Fiberglas Corp., 1851 Nicholas Bldg., Toledo 1, Ohio. In Canada, Fiberglas Canada Ltd., Oshawa, Ontario.*



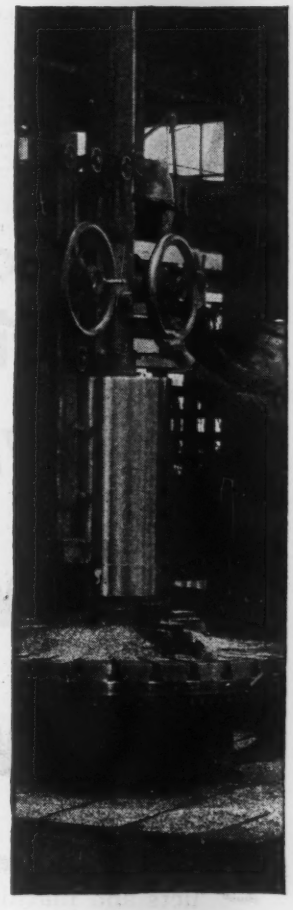
ARMY E NAVY

FIBERGLAS THERMAL INSULATION

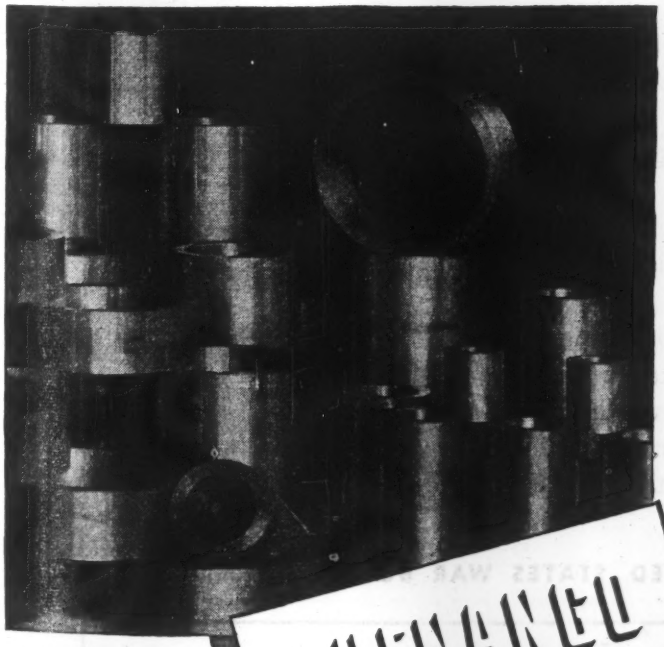
*T. M. Reg. U. S. Pat. Off.



You Waste Less Metal



WITH CENTRIFUGAL CASTINGS BY SHENANGO-PENN



SHENANGO-PENN specializes in centrifugal castings of bronze, iron alloys, and many special alloys of aluminum and manganese bronze, nickel silver, and other ferrous and non-ferrous metals. The density of our centrifugally cast metal makes it possible to leave a minimum of metal for finishing (sometimes as little as 1/16 of an inch in smaller castings). This means valuable savings of critical metals. Finishing costs and finishing time are also reduced.

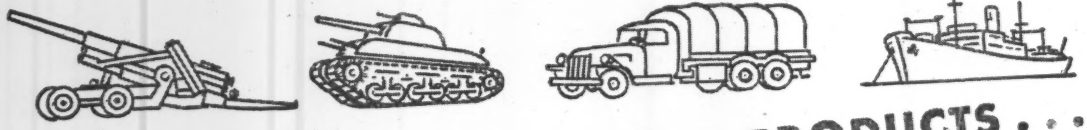
We can help you speed production of vital parts still more with our modern machine shop, fully equipped for boring, turning, facing, honing, grooving, threading, milling, etc., as well as for all types of special work.

Shenango-Penn has pioneered in centrifugal casting and is equipped to cast tubular bars or cylinders, ranging from 2″ to 26″ O.D., up to 26 feet in length. Our products meet all Army, Navy and Air Corps requirements. Write for booklet No. 143 describing industrial applications and possible uses of centrifugal castings.

SHENANGO-PENN MOLD COMPANY
1243 West 3rd Street, Dover, Ohio

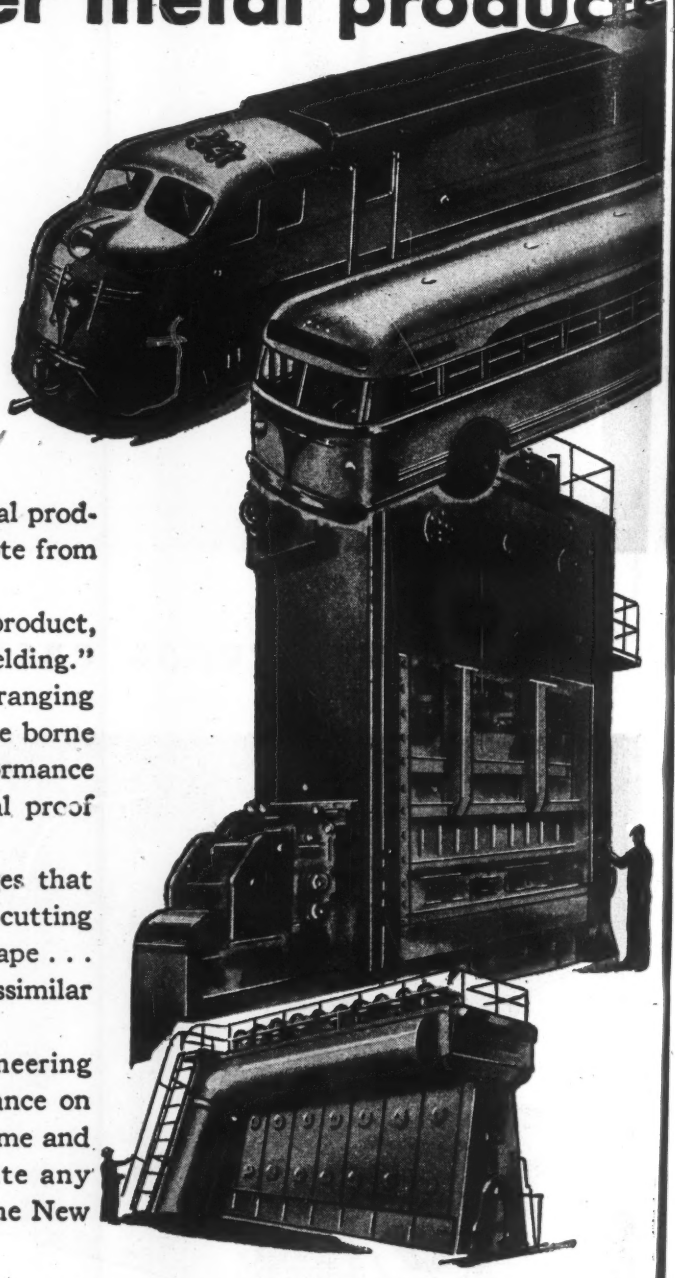
SHENANGO-PENN

ALL BRONZES • MONEL METAL • ALLOY IRONS •



LIKE THESE PROVEN WAR PRODUCTS . . .

Peacetime's better metal products *will be* FLAME-CUT *and* WELDED



DESIGNERS who are now planning peacetime metal products and machines will be wise to take this note from the war designer—

"For a stronger, lighter, better-looking metal product, design it for construction by flame-cutting and welding."

Hundreds of flame-cut and welded war products, ranging from tiny aircraft parts to massive cargo ships, have borne out the wisdom of this statement. And their performance in the tough proving ground of battle gives factual proof of their superiority.

Flame-cutting and welding offer many advantages that every designer should consider . . . fast, economical cutting of steel of any section into any regular or irregular shape . . . flexibility, speed and economy in joining similar or dissimilar metals into a strong, "one-piece" unit.

Representatives of Air Reduction's Field Engineering Division will be glad to give you all possible assistance on the use of the oxyacetylene flame and the electric arc. Call or write any Airco office or Dept. MD, at the New York address.

★ BUY UNITED STATES WAR BONDS ★

AIRCO

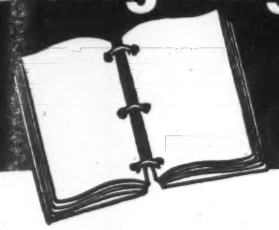
AIR REDUCTION

General Offices: 60 EAST 42nd STREET, NEW YORK 17, N. Y.

In Texas: MAGNOLIA AIRCO GAS PRODUCTS CO. • General Offices: HOUSTON 1, TEXAS

Offices in all Principal Cities

Designing Molded Plastics Parts: CHEMICAL RESISTANCE



From the engineering files of One Plastics Avenue

Many applications of plastics are specified to take advantage of the chemical resistance of plastics. The degree of resistance is usually evaluated by the change in weight, dimensions, and surface appearance, or the loss of strength which the plastic shows when immersed in the chemical at a given temperature and for a given time.

Courtesy of E. I. Dupont de Nemours & Co.

Plastics is used for this rayon spinning bucket because it gives good acid resistance and light weight making the bucket easy to balance.

The various reagents which are commonly used are most conveniently grouped as shown in the chart below. The effect which they have on the plastic is measured by describing its appearance or condition after exposure. Unless applications duplicate these tests exactly, the table should be used only as a guide to pick the most likely materials, and actual service tests should be made.

Courtesy of Galloway Co., Inc.

Milk handling equipment such as these cream separator skimming disks makes use of the chemical resistance of plastics. These disks have good resistance to lactic acid and the corrosive cleaning solutions that are used in cleaning dairy equipment.

CHEMICAL RESISTANCE AT 25° C°

KEY

R — SURFACE ROUGHENED
D — DISSOLVED
N — NO EFFECT
S — SOFTENED
L — DELAMINATED
Z — CRAZED

	Phenolic	Cast Phenolic	Laminated Phenolic	Urea	Vinyl Chl. Acetate	Metha-crylate	Styrene	Cel. Nitrate	Cel. Acetate
30% Sulfuric Acid	R	N	S	R	N	N	N	N	Z
10% Nitric Acid	R	N	S	R	N	N	N	N	D
10% Sodium Hydroxide	D	D	L	N	N	N	N	Z	D
1% Sodium Hydroxide	R	D	S	N	N	N	N	Z	R
10% Sodium Chloride	N	N	S	N	N	N	N	N	N
Distilled Water	N	N	N	N	N	N	N	N	N
95% Ethyl Alcohol	N	N	N	N	N	R	N	D	D
Acetone	N	S	R	N	D	D	D	D	D
Carbon Tetrachloride	N	N	N	N	N	R	D	N	N
Gasoline	N	N	N	N	N	N	D	N	N

***REPRINTS** of this advertisement may be obtained by writing Section E-221, One Plastics Avenue, Pittsfield, Mass.*

Hear the General Electric radio programs: "The G-E All-girl Orchestra" Sunday 10 P.M. EWT, NBC. "The World Today" news every weekday 6:45 P.M. EWT, CBS.

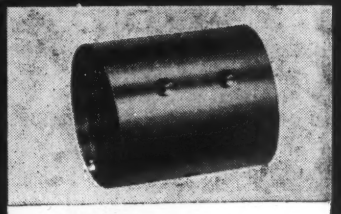
BUY WAR BONDS

FD-221

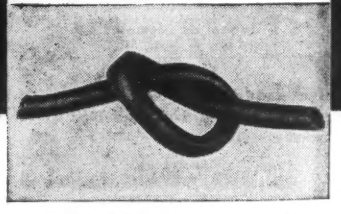
GENERAL ELECTRIC

YOU HAVE LONG WANTED TUBING LIKE...

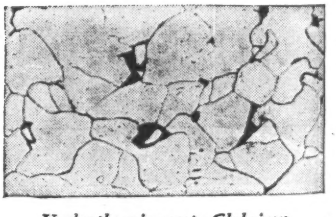
Globeiron



Housings for generators and motors are popular applications of Globeiron.



The ductility and toughness of Globeiron make it ideal for severe forming operations.



Under the microscope Globeiron shows a uniform structure of almost pure ferrite with only occasional patches of pearlite.

★ **HIGH MAGNETIC PERMEABILITY**

★ **UNIFORM DUCTILITY AND SOFTNESS**

★ **CORROSION RESISTANT**

This high-purity ingot iron seamless tubing, developed by Globe engineers, meets a definite need for high magnetic permeability, uniform ductility, softness and toughness.

Since Globeiron is seamless, its magnetic permeability is uniform throughout its cross section — a highly important advantage where magnetic permeability is a desired factor.

Worked hot or cold, Globeiron permits fabrication into almost any form and requires less thickness than steel. Superior in corrosion resistance, Globeiron gives longer service in applications where corrosive attack is accelerated by segregations or by the non-homogeneity of steel.

Send for Bulletin 109 — giving condensed technical information on Globeiron tubing.

In selecting the tubing with the exact characteristics you require, Globe engineers offer their services, with excellent laboratory facilities and production capacity to assure economy and quality control.

GLOBE TUBES

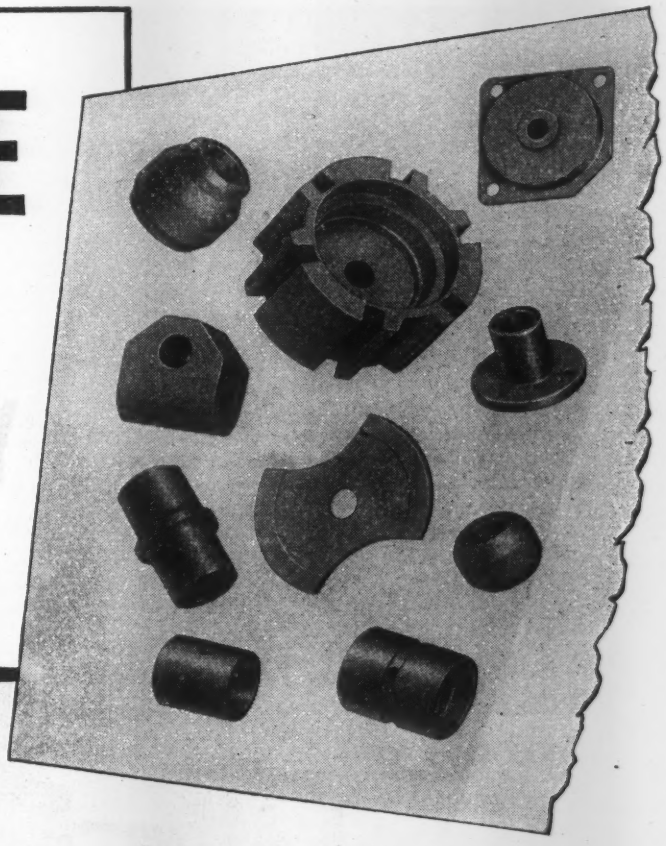
★ STAINLESS TUBES
★ BOILER TUBES
★ GLOBEIRON TUBING
★ GLOWELD TUBES
★ CONDENSER AND HEAT EXCHANGER TUBES
★ MECHANICAL TUBING

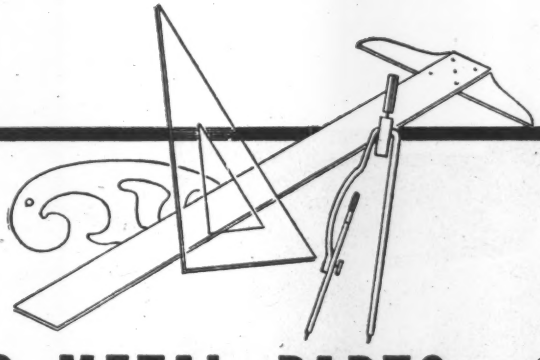
GLOBE STEEL *Tubes*

6,000

GLOBE STEEL TUBES CO., *Milwaukee, Wisconsin, U.S.A.*

KEYSTONE





FOR METAL PARTS *in* POST WAR DESIGNS

Modern design for tomorrow's era of *new living* will call for the accurate and economical production of low cost, precision, powdered metal parts.

Through our many years of research in the processing and molding of metals and anti-friction materials, we have pioneered in this new field, and today, many parts are being made quickly by compression molding that formerly could be produced only by tedious hours of machining, milling, slotting, grinding, and drilling.

Keystone powder metallurgy made parts are being produced at a higher rate of speed, maintained to closer tolerances than machine made parts, and at a great saving in cost. These parts not only are effecting a saving, but also are responsible for doubled production in many plants due to their uniformity, thereby eliminating hand fitting of each part.

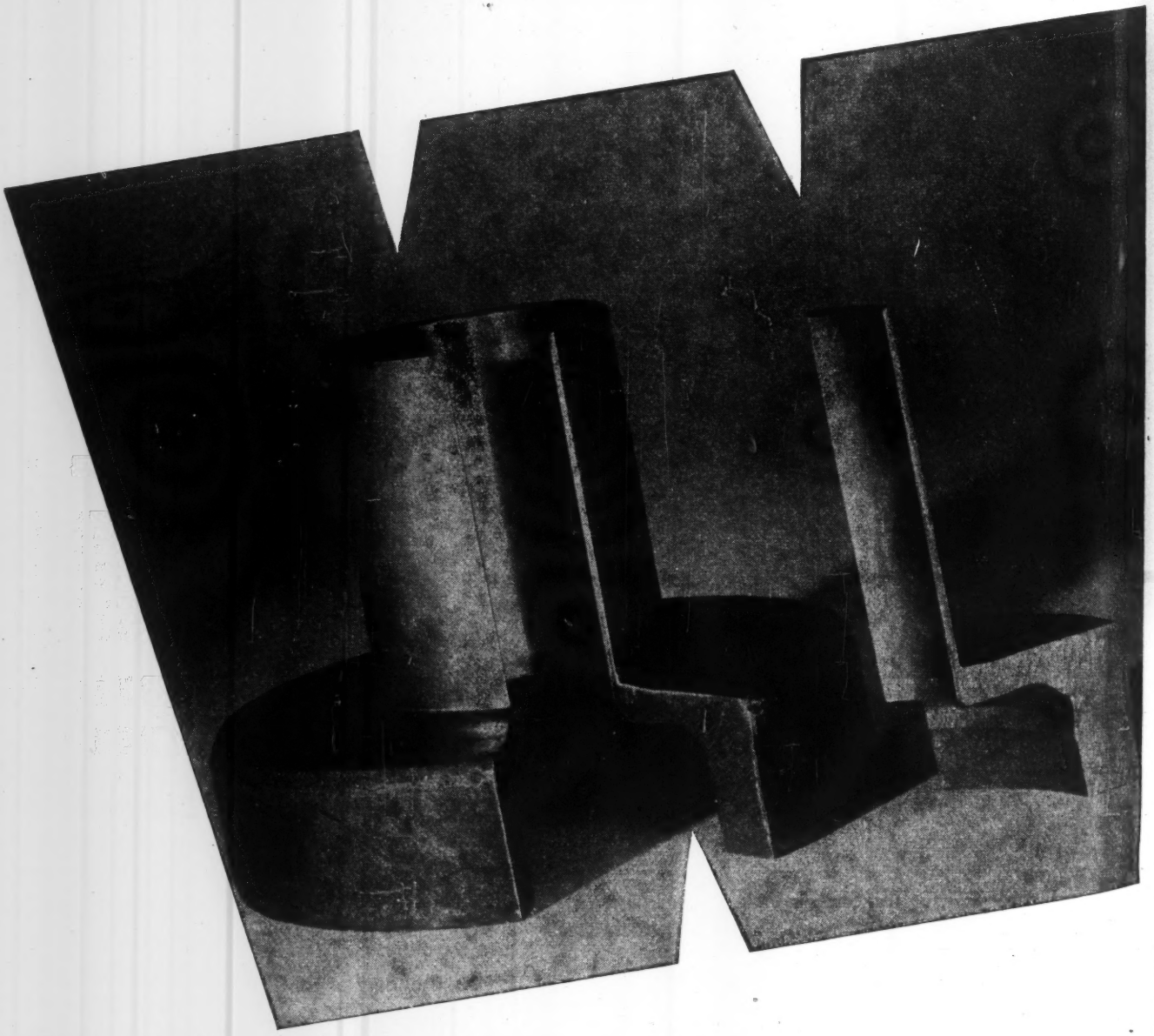
A new booklet has been compiled to acquaint designers and engineers with the various parts now being made by powder metallurgy and their present limitations, in order that this knowledge may be further utilized in design and construction. It will be sent without obligation.

✓

1. Economy of fabrication.
2. Alloys not possible by other methods.
3. Pre-lubrication of moving parts.
4. Shorter tooling time.
5. Higher rate of production.
6. Improved resistance to wear.
7. Ability to maintain tolerances not possible by other production methods.
8. Ability to vary density of part.
9. Elimination of secondary operation and set-up.
10. Substitute for unavailable material.

KEYSTONE CARBON COMPANY, INC.

MANUFACTURERS OF PRECISION MOLDED PRODUCTS
1935 State Street . . . SAINT MARYS . . . PENNA.



Close Tolerances of Presteel Stamping Cut Costs

Pressed from 0.500" steel, heavy flanged sleeve bearings similar to the one shown above are held to tolerances of ±.001" both inside and outside of the barrel and have a finish specified in micro inches (before silver plating). Previously, such bearings have been machined from tubing at a cost nearly 50% greater than the price of Presteel stampings.

Worcester Pressed Steel stampings made by carefully controlled press operations producing uniform parts to tolerances of thousandths of an inch or less have helped many manufacturers to lower costs and improve their products. Our engineering and production experience is at your disposal. Mail samples or prints to—

WORCESTER PRESSED STEEL CO.

810 Barber Avenue, Worcester 6, Mass.

ALLOY STEELS AND OTHER METALS COLD FASHIONED SINCE 1883

Because They Remain Accurate Longer

Precision Plug and Thread Gages Are Made of HAYNES STELLITE Alloy

● HAYNES STELLITE alloy has been adopted by a leading gage manufacturer as the standard material for making precision plug and thread gages. This was done because wear tests proved that these gages will remain accurate and usable longer than those made from any of 18 other materials tested.

Because of their low coefficient of friction and their outstanding resistance to wear, abrasion, and corrosion, gages made of HAYNES STELLITE alloy keep their exact gaging sizes longer.

The same properties that make HAYNES STELLITE alloy the ideal material for precision gages are also important in many other products where a hard, tough, abrasion- and corrosion-resistant material is needed. Send for further information and let us help you with any application you have in mind.

Only HAYNES STELLITE Alloys Offer All These Advantages

1. They resist wear and abrasion.
2. They are inherently hard — even at red heat.
3. They retain their good mechanical properties at high temperatures.
4. They resist atmospheric corrosion and corrosive chemicals.
5. They take and keep a high polish.
6. They have a low coefficient of friction.
7. They are practically non-magnetic.
8. They have a coefficient of expansion similar to that of steel.
9. They can be supplied in the form of castings, small sheets, and welding rod.

HAYNES STELLITE TRADE-MARK

HAYNES STELLITE COMPANY

Unit of Union Carbide and Carbon Corporation

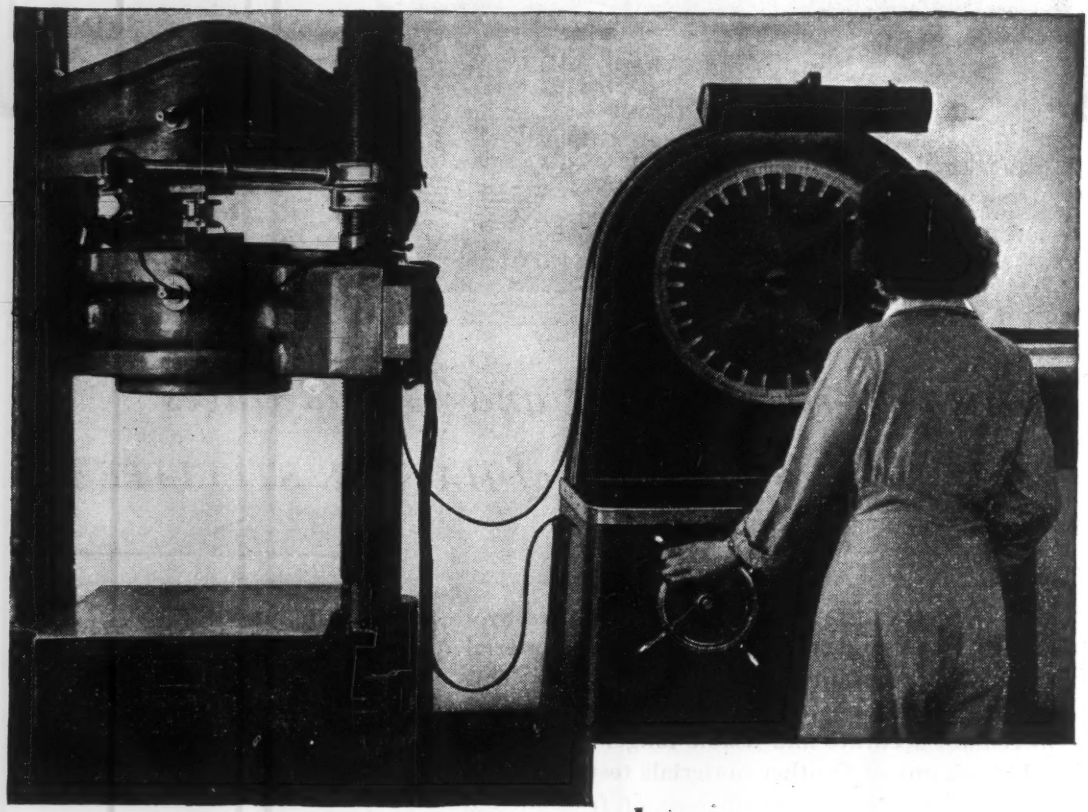
New York 17, N. Y. UCC Kokomo, Indiana

Chicago—Cleveland—Detroit—Houston—Los Angeles—San Francisco—Tulsa

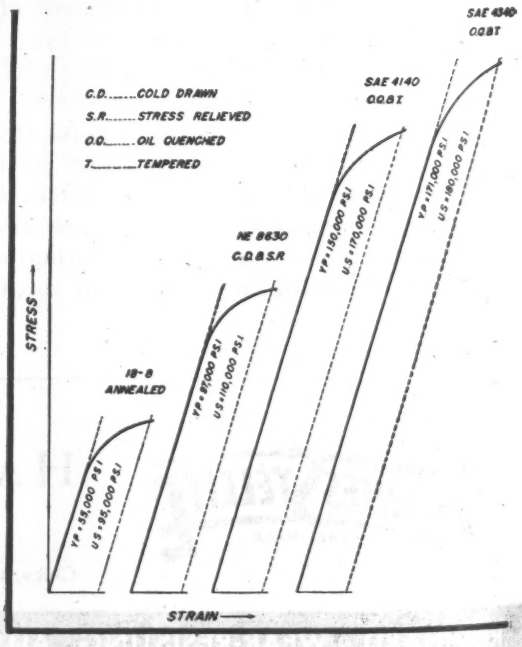
RED-HARD, WEAR-RESISTING ALLOY OF COBALT, CHROMIUM, AND TUNGSTEN

"HAYNES STELLITE" is a registered trade-mark of the Haynes Stellite Company.

B&W Maintains Technical



Strain on specimen subjected to stretching on 300,000-pound tensile testing machine is autographically recorded.



Reproduction of a recording of strain curves—showing tensile and yield point values for B&W tubular products under several conditions of heat treatment.

Control of Tubing Through Tensile Tests

Literally hundreds of tensile tests are made daily in B&W's modern laboratory to make sure that the tubular products furnished by the company conform exactly to customers' specifications of yield strength, elongation and ultimate tensile strength. Results of these tests serve the equally important purpose of checking uniformity of B&W Tubes.

Strain diagrams, in many instances, are autographically recorded in determining yield strength and these reports form a part of the permanent record of each test for future reference.

These extensive tensile tests are but one example of the thorough metallurgical supervision applied to the production of B&W Tubes . . . are one of the reasons why B&W Tubes can be depended upon to have the right physical properties necessary to give lasting dependability and economy in each mechanical application.

The vast fund of experience and technical data accumulated by B&W in making and applying tubing for a wide diversity of mechanical uses is available to all tube users, in selecting the right kind of tubing for any requirement. B&W Tubes cover the complete range from low carbon steel to highly alloyed stainless steels.

B&W TUBES

SEAMLESS. Complete range of carbon, alloy and stainless steels. Sizes: ½ in. to 8⅝ in. O.D.

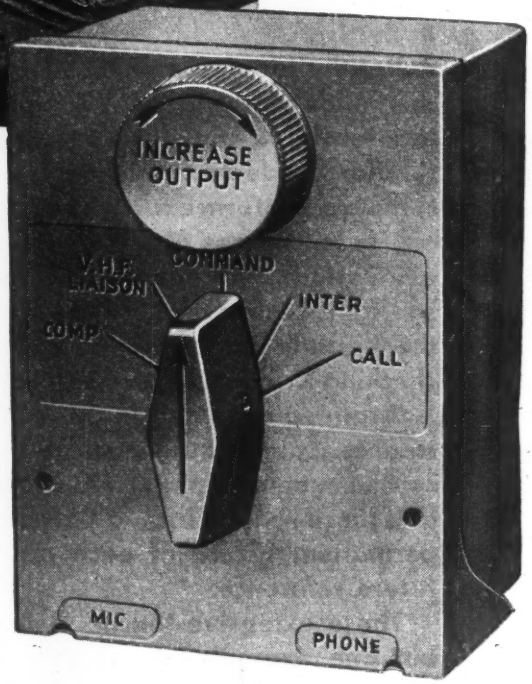
ELECTRIC-RESISTANCE WELDED Carbon steel grades. Sizes: ¾ in. to 4 in. O.D.

THE BABCOCK & WILCOX TUBE CO.

Welded Tube Division
Alliance, Ohio

Seamless Tube Division
Beaver Falls, Pa.

Official Photo U. S. Air Forces, Faces disguised.



93⅓% SAVINGS
Through DIE-CASTING

CAREFULLY compiled cost figures by "Customer X" reveal this fantastic saving in actual practice by using die-castings as compared with other production methods.

By using ADVANCE die-cast parts, on the "Jack Box" for bombers' intercommunication system here illustrated this prominent electrical equipment manufacturer *cut in half* the manhours and number of operators required. Released for other work were not only these men but also the machines involved—millers, shapers, sanders, and grinders,—occupying 4000 sq. ft. of floor space!

Consider what this means in stepping up production now and in meeting keen competition after V-Day.

Will Die-Castings figure prominently in *your* post-war program? We invite confidential consultation with our engineers NOW.

ADVANCE
PRESSURE CASTINGS, INC.

ENGINEERS, DESIGNERS AND MANUFACTURERS OF DIE-CASTINGS OF "QUALITY WITH ECONOMY"

36 North 15th Street, Brooklyn 22, New York

The Modern Bearings

● The latest liquid-cooled and the latest air-cooled aircraft engines, the various U. S. Army trucks, two famous British artillery pieces—all have one thing in common. They contain more sleeve bearings than bearings of all other types combined.

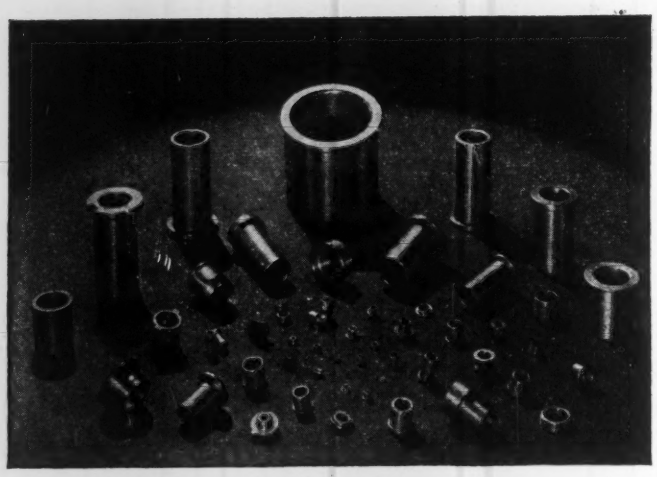
The war has stimulated advances in sleeve bearing design and manufacture, making the sleeve bearing successful where other types have failed.

The Bunting organization has contributed its share to this advance. Bunting Cast Bronze Bearings are manufactured in stock or special dimensions, to standard or precision tolerances. Write for catalog.

Factory Finished Tubular and Solid Bars of Bearing Bronze are available for your own manufacture of special bearings. Ask your wholesaler... The Bunting Brass & Bronze Company, Toledo 9, Ohio... Warehouses in Principal Cities. 3

Bunting

BRONZE BUSHINGS ☆ BEARINGS ☆ PRECISION BRONZE BARS



Reliable Bearings

for Both War and Postwar Production

The Pioneer that's OIL-RETAINING COMPO POROUS BRONZE *"first" every year!*

Insure these many advantages:

1—Longer Bearing Service with Uninterrupted Operation
2—Freedom from Shutdowns due to Failure of Lubrication
3—Savings on Elimination of Machining Operations
4—Release Machine Tools for Other Profitable Production
5—No Casting Defects such as sand spots or segregation
6—Eliminate Oil Holes or Grooves. "Built-in" Lubrication
7—Eliminates Oil Spatter damage to processed products
8—Saving in Materials—die-formed, no boring or turning
9—Lower Installation, Maintenance and Operating Costs

Write for copy of fully illustrated Compo Bulletin • Immediate shipments on Hundreds of Sizes in Sleeve Type and Flanged Bearings, Washers, Solid Plugs and Self-Aligning shapes • Write for Compo Stock List

Back the Attack—Buy War Bonds

ARMY E NAVY

Bound Brook Oil-Less Bearing Co.
(Established 1883)
Main Office and Plant, Bound Brock, N. J.
1255 Book Building, Detroit 26, Mich.
1901 Santa Fe Avenue, Los Angeles 21, Cal.

FOR BETTER MACHINES AND APPLIANCES

FELT *is First for* MOUNTING MACHINERY

1. ABSORBS VIBRATION
2. LOWERS NOISE LEVEL
3. FACILITATES MACHINE RE-LOCATION

Felt pads, under and in heavy machinery, "take the teeth" out of vibrations that otherwise nibble away at vital machine parts — and slowly undermine plant structure. Felt mountings preserve accuracy of precision machines — prevent transmission of vibrations to adjacent machines, or from floor to floor — and save building from damage through mass machine vibration.

Non-destructive Felt mountings offer decided advantages. Unharmed by oils or cleaning compounds! Cement-mounted Felt pads need no further fastening — permitting rapid removal and re-installation of machines without drilling or patching of floors.

"Soft pedaling" vibration with the *correct* Felts increases service life of machines many times over. Write for your copy of Data Sheet No. 10, "Vibration Isolation With Felt," giving basic technical information on this important subject.

American Felt Company
TRADE MARK

General Offices: GLENVILLE, CONN.

New York; Boston; Chicago; Detroit; Philadelphia; Cleveland; St. Louis Los Angeles; Seattle; San Francisco; Dallas

PRODUCERS OF FINEST QUALITY PARTS FOR OIL RETAINERS, WICKS, GREASE RETAINERS, DUST EXCLUDERS, GASKETS, PACKING, VIBRATION ISOLATION, INSULATION AND SOUND ABSORPTION FELTS

To protect your product against costly failures due to

1 A material with distinctive properties of resistance to wear, impact, fatigue, corrosion . . . capable of lasting several times as long as ordinary bronzes.

2 An engineered alloy . . . with physical properties designed to fit the specific application, on the basis of over 30 years of specialization . . . including experience with the requirements of more than 2,000 customers in diversified industries.

3 Quality control to hold these properties within narrow limits . . . and the specialized experience necessary to produce to a super-standard.

4 Diversified production facilities, concentrated and coordinated in one place, for working the metal by every metalworking process in general use, including:

Sand Casting	*Extrusion*
Centrifugal Casting	*Welding (with Ampco-Trode)*
Forging	*Precision Machining*

. . . thus making available a complete, self-contained parts source.

5 Engineering and production "know-how" for converting your designers' drawings into a practical manufacturing proposition, at a per-piece cost commensurate with results.

6 A nation-wide organization of field engineers, capable of assisting you in this specialized aspect of the modern trend toward engineered materials.

7 A record of proved performance under severe conditions, in war and peace, as original equipment in hundreds of leading makes of machinery and equipment.

8 A national reputation which makes Ampco Metal parts a sales asset for any equipment in which they are employed.

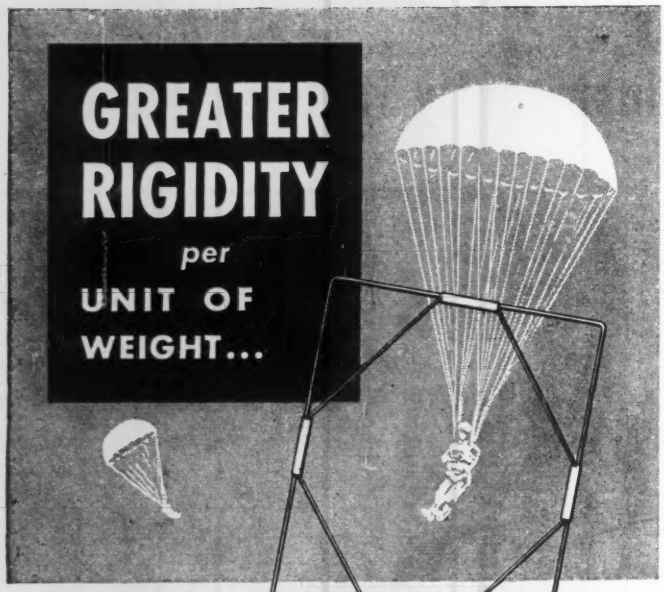
Send us your prints when you are ready to consider materials. Write for bulletins. *Ampco Metal, Inc., Dept. MD-10, Milwaukee, Wis.*

Ampco Field Offices in Principal Cities.

AW-10

AMPCO Metal
The Metal without an Equal

You are invited to visit the Ampco Metal exhibit (Space D130) at the National Metal Congress, October 16 to 20.



because it's made of

FORMED WIRE & STRIP STEEL

Measuring 12" x 15" and weighing 8½ ounces, this wire and strip steel assembly is the frame that preserves the shape and provides a stiffener for Army and Navy parachute packs—enabling the pilot chute to pull out the folds of the main chute without fouling.

This frame must be light in weight, be rigid and free from warping. It must be made without sharp edges and have a rust-proof finish. The formed Wire Assembly with strip steel fittings is filling all requirements.

EASY TO PRODUCE

Production requirements were simple. The outer frame is a single piece, formed in two simple operations. The inner frame is in two parts, assembled and held in place by four ferrules which are power-pressed together for a strong bond. Only simple dies and fixtures were needed. Years of "know how" supplied the rest.

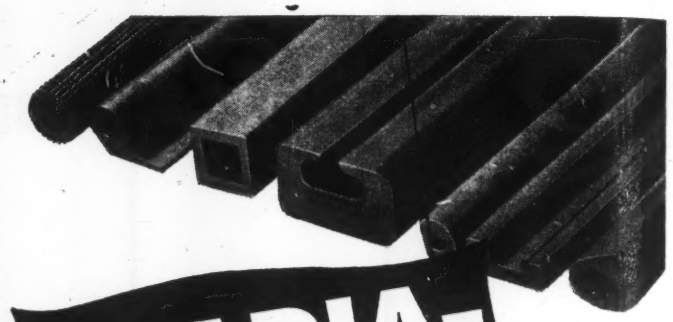
WIRE GOODS Headquarters

★ Why not check your own requirements today? Possibly you can substitute low-cost wire and strip steel assembly for an expensive casting or forging. Just send a sample or drawing for a free, confidential analysis and recommendation.

E. H. TITCHENER CO.

Wire Goods Headquarters

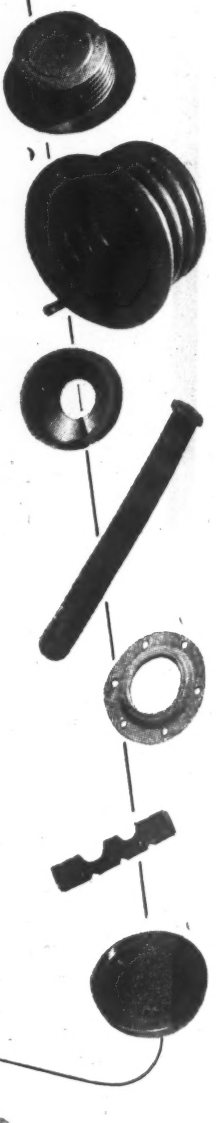
300 Walnut Street Binghamton, N. Y.



ACADIA-

Outstanding Processor of

SYNTHETIC RUBBER PRODUCTS



★ Combining experience with superior manufacturing capabilities, Acadia Synthetic Products offers to industry synthetic rubber produced *specifically* for the service it will see.

Compounds that meet Army, Navy, and A.M.S. specifications are in wide use as ring seals, diaphragms, gaskets, bushings, chafing strips, grommets, channels, etc.

Whether you require synthetic rubber in sheets, cut shapes, molded parts or extruded forms, Acadia is able to promptly fill your needs.

Acadia's experience in synthetics—plus their manufacturing ability—plus the service they offer through the cooperation of their engineers with you to fill all your needs—these combine to make Acadia an unusual and outstanding source for your synthetic rubber. Write us today.

ACADIA *Synthetic* **PRODUCTS**

Processors of Synthetic Rubber and Plastics
Sheets · Extrusions
Molded Parts

DIVISION WESTERN FELT WORKS

LARGEST INDEPENDENT MANUFACTURERS AND CUTTERS OF FELT

4035-4117 Ogden Ave., Chicago 23, Ill. · Branch Offices in All Principal Cities

NEW GUIDE
TO PRECISION-MADE PLASTICS BY SILLCOCKS-MILLER

• *FREE BOOKLET* PRESENTS 4-POINT SERVICE TO HELP DESIGN ENGINEERS

How the facilities and experiences of Sillcocks-Miller specialists can help you solve your problems in precision-fabricated plastics is told in a new illustrated booklet now available.

Designers and manufacturers in need of plastic parts and products made to extremely close tolerances will find The Sillcocks-Miller Company a most dependable source for design and development service and for highest quality production.

Whether you are now using plastics or want to learn why it will pay you to convert to plastics, you should have a copy of this helpful booklet. Write for it today—without obligation.

THE SILLCOCKS-MILLER COMPANY

Office & Factory: 10 W PARKER AVE., MAPLEWOOD, N. J.

Mailing Address: SOUTH ORANGE, N. J.

IT COSTS YOU LESS TO PAY A LITTLE MORE FOR SILLCOCKS-MILLER QUALITY

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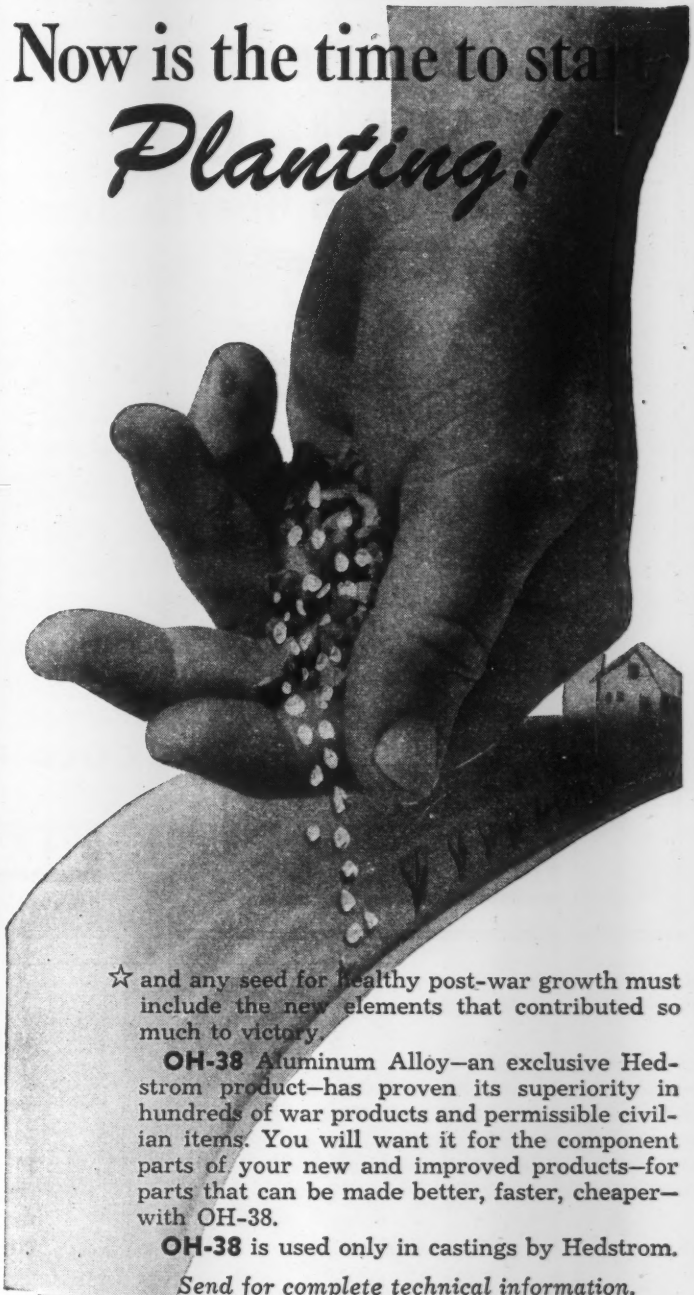
Planting!



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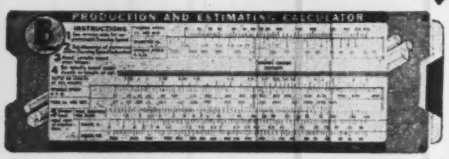

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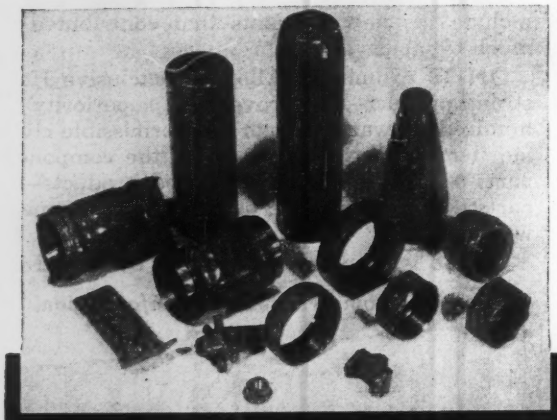

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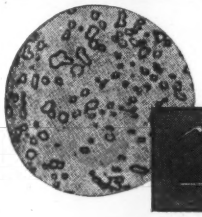

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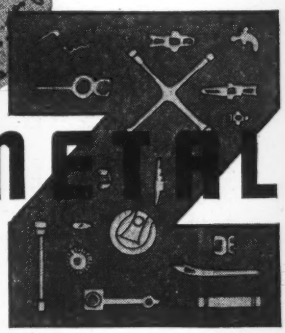

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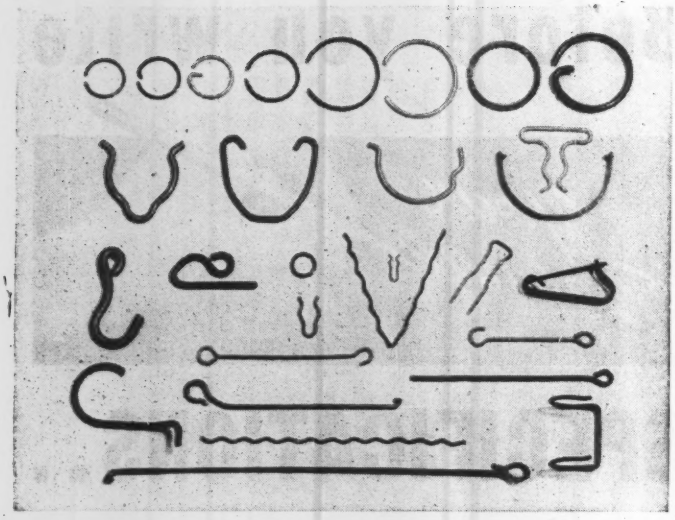

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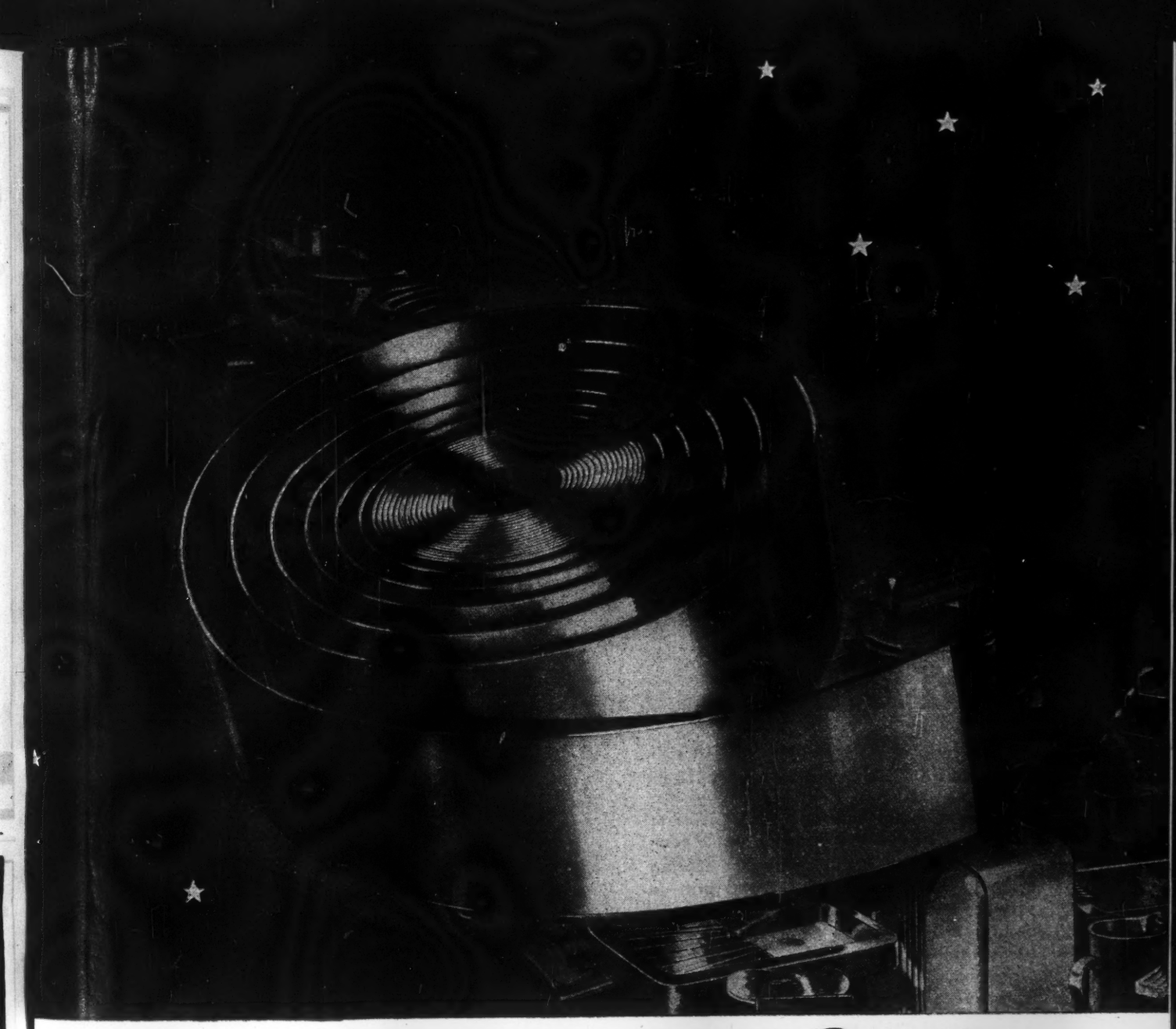

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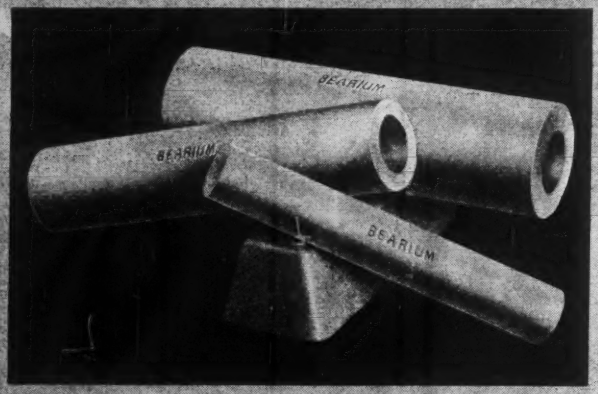

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Vinylite

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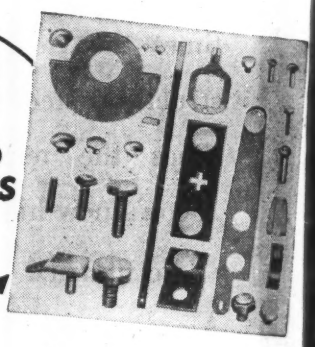

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